ASROCK

FM2A88X EXTREME6+

User Manual

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(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

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The Lithium battery adopted on this motherboard contains Perchlorate, a toxic substance controlled in Perchlorate Best Management Practices (BMP) regulations passed by the California Legislature. When you discard the Lithium battery in California, USA, please follow the related regulations in advance.
"Perchlorate Material-special handling may apply, see www.dtsc.ca.gov/hazardouswaste/perchlorate"

ASRock Website: http://www.asrock.com

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1. Introduction

Thank you for purchasing ASRock ***FM2A88X Extreme6+*** motherboard, a reliable motherboard produced under ASRock's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock's commitment to quality and endurance.

In this documentation, Chapter 1 and 2 contains the introduction of the motherboard and step-by-step installation guides. Chapter 3 contains the operation guide of the software and utilities. Chapter 4 contains the configuration guide of the BIOS setup.

Because the motherboard specifications and the BIOS software might be updated, the content of this manual will be subject to change without notice. In case any modifications of this manual occur, the updated version will be available on ASRock website without further notice. You may find the latest VGA cards and CPU support lists on ASRock website as well. ASRock website http://www.asrock.com

If you require technical support related to this motherboard, please visit our website for specific information about the model you are using.
www.asrock.com/support/index.asp

1.1 Package Contents

ASRock ***FM2A88X Extreme6+*** Motherboard (ATX Form Factor)
ASRock ***FM2A88X Extreme6+*** Quick Installation Guide
ASRock ***FM2A88X Extreme6+*** Support CD
4 x Serial ATA (SATA) Data Cables (Optional)
1 x I/O Panel Shield

ASRock Reminds You...

To get better performance in Windows® 8 / 8 64-bit / 7 / 7 64-bit, it is recommended to set the BIOS option in Storage Configuration to AHCI mode.

1.2 Specifications

Platform	- ATX Form Factor - Premium Gold Capacitor design (100% Japan-made high-quality conductive polymer capacitors)
A-Style	- Home Cloud - Purity Sound™ - HDMI-In
CPU	- Supports Socket FM2+ 95W / FM2 100W processors - Digi Power design - 8 + 2 Power Phase design
Chipset	- AMD A88X (Bolton-D4)
Memory	- Dual Channel DDR3 Memory Technology - 4 x DDR3 DIMM Slots - Supports DDR3 2600+(OC)/2400(OC)/2133(OC)/1866/1600/1333/1066 non-ECC, un-buffered memory (see **CAUTION 1**) * DDR3 2600+ is only supported with two DIMMs. - Max. capacity of system memory: 64GB (see **CAUTION 2**) - Supports Intel® Extreme Memory Profile (XMP) 1.3 / 1.2 - Supports AMD Memory Profile Technology (AMP) up to AMP 2400
Expansion Slot	- 2 x PCI Express 3.0 x16 Slots (PCIE2/PCIE4: single at x16 (PCIE2); dual at x8 (PCIE2) / x8 (PCIE4)) * PCIE 3.0 is only supported with FM2+ CPU. With FM2 CPU, it only supports PCIE 2.0. - 1 x PCI Express 2.0 x16 Slot (PCIE5 @ x4 mode) - 2 x PCI Express 2.0 x1 Slots - 2 x PCI Slots - Supports AMD Quad CrossFireX™, 3-Way CrossFireX™, CrossFireX™ and Dual Graphics
Graphics	- Integrated AMD Radeon HD 8000/7000 series graphics in A-series APU - DirectX 11.1, Pixel Shader 5.0 with FM2+ CPU. DirectX 11, Pixel Shader 5.0 with FM2 CPU. - Max. shared memory 2GB - Four VGA output options: D-Sub, DVI-D, HDMI and DisplayPort Ports - Supports Quad Monitor with FM2+ CPU. Supports Triple Monitor with FM2 CPU. - Supports HDMI Technology with max. resolution up to 1920x1200 @ 60Hz

	- Supports Dual-link DVI-D with max. resolution up to 2560x1600 @ 60Hz - Supports D-Sub with max. resolution up to 1920x1200 @ 60Hz - Supports DisplayPort 1.2 with max. resolution up to 4K x 2K (4096x2400) @ 60Hz or 4K x 2K (4096x2160) @ 60Hz - Supports DP++ - Supports Multi-Streaming - Supports Auto Lip Sync, Deep Color (12bpc), xvYCC and HBR (High Bit Rate Audio) with HDMI Port (Compliant HDMI monitor is required) (see **CAUTION 3**) - Supports Blu-ray Stereoscopic 3D with HDMI Port - Supports AMD Steady Video™ 2.0: New video post processing capability for automatic jitter reduction on home/online video - Supports HDCP with DVI-D, HDMI and DisplayPort Ports - Supports Full HD 1080p Blu-ray (BD) playback with DVI-D, HDMI and DisplayPort Ports

Audio	- 7.1 CH HD Audio with Content Protection (Realtek ALC1150 Audio Codec)
	- Premium Blu-ray Audio support
	- Supports Purity Sound™
	    - 115dB SNR DAC with Differential Amplifier
	    - TI® NE5532 Premium Headset Amplifier (Supports up to 600 ohm headsets)
	    - Direct Drive Technology
	    - EMI Shielding Cover
	    - PCB Isolate Shielding
	- Supports DTS Connect

LAN	- PCIE x1 Gigabit LAN 10/100/1000 Mb/s - Qualcomm® Atheros® AR8171 - Supports Qualcomm® Atheros® Security Wake On Internet Technology - Supports Wake-On-LAN - Supports Energy Efficient Ethernet 802.3az - Supports PXE
Rear Panel I/O	- 1 x PS/2 Mouse/Keyboard Port - 1 x D-Sub Port - 1 x DVI-D Port - 1 x HDMI-Out Port - 1 x HDMI-In Port - 1 x DisplayPort

	- 1 x Optical SPDIF Out Port - 2 x USB 2.0 Ports - 1 x eSATA Connector - 2 x USB 3.0 Ports (AMD A88X (Bolton-D4)) - 2 x USB 3.0 Ports (ASMedia ASM1042) - 1 x RJ-45 LAN Port with LED (ACT/LINK LED and SPEED LED) - HD Audio Jacks: Rear Speaker/Central/Bass/Line in/Front Speaker/Microphone
Storage	- 7 x SATA3 6.0 Gb/s Connectors, support RAID (RAID 0, RAID 1, RAID 5 and RAID 10), NCQ, AHCI and Hot Plug
Connector	- 1 x IR Header - 1 x COM Port Header - 1 x Chassis Intrusion Header - 1 x Power LED Header - 2 x CPU Fan Connectors (1 x 4-pin, 1 x 3-pin) - 3 x Chassis Fan Connectors (1 x 4-pin, 2 x 3-pin) - 1 x Power Fan Connector (3-pin) - 1 x 24 pin ATX Power Connector - 1 x 8 pin 12V Power Connector - 1 x XFire Power Connector - 1 x Front Panel Audio Connector - 3 x USB 2.0 Headers (Support 6 USB 2.0 ports) - 1 x USB 3.0 Header by AMD A88X (Bolton-D4) (Supports 2 USB 3.0 ports) - 1 x Dr. Debug with LED - 1 x Power Switch with LED - 1 x Reset Switch with LED - 1 x BIOS Selection Switch
BIOS Feature	- 2 x 64Mb AMI UEFI Legal BIOS with multilingual GUI support (1 x Main BIOS and 1 x Backup BIOS) - Supports Secure Backup UEFI Technology - Supports "Plug and Play" - ACPI 1.1 compliance wake up events - Supports jumperfree - SMBIOS 2.3.1 support - DRAM, VDDP, VDDR Voltage multi-adjustment
Support CD	- Drivers, Utilities, AntiVirus Software (Trial Version), CyberLink MediaEspresso 6.5 Trial, Google Chrome Browser and Toolbar, Start8 (30 days trial)
Hardware Monitor	- CPU temperature sensing - Chassis temperature sensing

	- CPU Fan Tachometer - Chassis Fan Tachometer - CPU/Chassis Quiet Fan - CPU/Chassis Fan multi-speed control - CASE OPEN detection - Voltage monitoring: +12V, +5V, +3.3V, Vcore
OS	- Microsoft® Windows® 8.1 32-bit / 8.1 64-bit / 8 32-bit / 8 64-bit / 7 32-bit / 7 64-bit
Certifications	- FCC, CE, WHQL - ErP/EuP ready (ErP/EuP ready power supply is required)

* For detailed product information, please visit our website: http://www.asrock.com

WARNING

Please realize that there is a certain risk involved with overclocking, including adjusting the setting in the BIOS, applying Untied Overclocking Technology, or using third-party overclocking tools. Overclocking may affect your system's stability, or even cause damage to the components and devices of your system. It should be done at your own risk and expense. We are not responsible for possible damage caused by overclocking.

CAUTION!

1. Whether 2600/2400/2133/1866/1600MHz memory speed is supported depends on the CPU you adopt. If you want to adopt DDR3 2600/2400/2133/1866/1600 memory module on this motherboard, please refer to the memory support list on our website for the compatible memory modules.
   ASRock website http://www.asrock.com
2. Due to the operating system limitation, the actual memory size may be less than 4GB for the reservation for system usage under Windows® 8 / 7. For Windows® 64-bit OS with 64-bit CPU, there is no such limitation. You can use ASRock XFast RAM to utilize the memory that Windows® cannot use.
3. xvYCC and Deep Color are only supported under Windows® 8 64-bit / 8 / 7 64-bit / 7. Deep Color mode will be enabled only if the display supports 12bpc in EDID. HBR is supported under Windows® 8 64-bit / 8 / 7 64-bit / 7.

1.3 Unique Features

ASRock A-Tuning

A-Tuning is ASRock's multi purpose software suite with a new interface, more new features and improved utilities, including XFast RAM, Dehumidifier, Good Night LED, FAN-Tastic Tuning, OC Tweaker and a whole lot more.

ASRock Instant Boot

ASRock Instant Boot allows you to turn on your PC in just a few seconds, provides a much more efficient way to save energy, time, money, and improves system running speed for your system. It leverages the S3 and S4 ACPI features which normally enable the Sleep/Standby and Hibernation modes in Windows® to shorten boot up time. By calling S3 and S4 at specific timing during the shutdown and startup process, Instant Boot allows you to enter your Windows® desktop in a few seconds.

ASRock Instant Flash

ASRock Instant Flash is a BIOS flash utility embedded in Flash ROM. This convenient BIOS update tool allows you to update system BIOS without entering operating systems first like MS-DOS or Windows®. With this utility, you can press the <F6> key during the POST or the <F2> key to enter into the BIOS setup menu to access ASRock Instant Flash. Just launch this tool and save the new BIOS file to your USB flash drive, floppy disk or hard drive, then you can update your BIOS only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system.

ASRock APP Charger

If you desire a faster, less restricted way of charging your Apple devices, such as iPhone/iPad/iPod Touch, ASRock has prepared a wonderful solution for you - ASRock APP Charger. Simply install the APP Charger driver, it makes your iPhone charge much quickly from your computer and up to 40% faster than before. ASRock APP Charger allows you to quickly charge many Apple devices simultaneously and even supports continuous charging when your PC enters into Standby mode (S1), Suspend to RAM (S3), hibernation mode (S4) or power off (S5). With APP Charger driver installed, you can easily enjoy the marvelous charging experience.

ASRock XFast USB

ASRock XFast USB can boost USB storage device performance. The performance may depend on the properties of the device.

ASRock XFast LAN

ASRock XFast LAN provides a faster internet access, which includes the benefits listed below. LAN Application Prioritization: You can configure your application's priority ideally and/or add new programs. Lower Latency in Game: After setting online game's priority higher, it can lower the latency in games. Traffic Shaping: You can watch Youtube HD videos and download simultaneously. Real-Time Analysis of Your Data: With the status window, you can easily recognize which data streams you are transferring currently.

ASRock XFast RAM

ASRock XFast RAM is included in A-Tuning. It fully utilizes the memory space that cannot be used under Windows® 32-bit operating systems. ASRock XFast RAM shortens the loading time of previously visited websites, making web surfing faster than ever. And it also boosts the speed of Adobe Photoshop 5 times faster. Another advantage of ASRock XFast RAM is that it reduces the frequency of accessing your SSDs or HDDs in order to extend their lifespan.

ASRock Crashless BIOS

ASRock Crashless BIOS allows users to update their BIOS without fear of failing. If power loss occurs during the BIOS update process, ASRock Crashless BIOS will automatically finish the BIOS update procedure after regaining power. Please note that BIOS files need to be placed in the root directory of your USB disk. Only USB2.0 ports support this feature.

ASRock OMG (Online Management Guard)

Administrators are able to establish an internet curfew or restrict internet access at specified times via OMG. You may schedule the starting and ending hours of internet access granted to other users. In order to prevent users from bypassing OMG, guest accounts without permission to modify the system time are required.

ASRock Internet Flash

ASRock Internet Flash searches for available UEFI firmware updates from our servers. In other words, the system can auto-detect the latest UEFI from our servers and flash them without entering Windows® OS.

ASRock UEFI System Browser

ASRock UEFI system browser is a useful tool included in graphical UEFI. It can detect the devices and configurations that users are currently using in their PC. With the UEFI system browser, you can easily examine the current system configuration in UEFI setup.

ASRock UEFI Tech Service

Contact ASRock Tech Service by sending a support request from the UEFI setup utility if you are having trouble with your PC.

ASRock Dehumidifier Function

Users may prevent motherboard damages due to dampness by enabling “Dehumidifier Function”. When enabling Dehumidifier Function, the computer will power on automatically to dehumidify the system after entering S4/S5 state.

ASRock Easy RAID Installer

ASRock Easy RAID Installer can help you to copy the RAID driver from a support CD to your USB storage device. After copying the RAID driver to your USB storage device, please change “SATA Mode” to “RAID”, then you can start installing the OS in RAID mode.

ASRock Easy Driver Installer

For users that don’t have an optical disk drive to install the drivers from our support CD, Easy Driver Installer is a handy tool in the UEFI that installs the LAN driver to your system via an USB storage device, then downloads and installs the other required drivers automatically.

ASRock Interactive UEFI

ASRock Interactive UEFI is a blend of system configuration tools, cool sound effects and stunning visuals. The unprecedented UEFI provides a more attractive interface and brings a lot more amusing.

ASRock Fast Boot

With ASRock's exclusive Fast Boot technology, it takes less than 1.5 seconds to logon to Windows® 8 from a cold boot. No more waiting! The speedy boot will completely change your user experience and behavior.

ASRock X-Boost

Brilliantly designed for combo overclocking, ASRock X-Boost Technology is able to unleash the hidden power of your CPUs. Simply press "X" when turning on the PC, X-Boost will automatically overclock the relative components to get up to 15.77% performance boost! With the smart X-Boost, overclocking CPU can become a near one-button process.

ASRock Restart to UEFI

Windows® 8 brings the ultimate boot up experience. The lightning boot up speed makes it hard to access the UEFI setup. ASRock Restart to UEFI technology is designed for those requiring frequent UEFI access. It is included in ASRock's exclusive all-in-one A-Tuning tuning program that allows users to easily enter the UEFI automatically when turning on the PC next time. Just simply enable this function; the PC will be assured to access the UEFI directly in the very beginning.

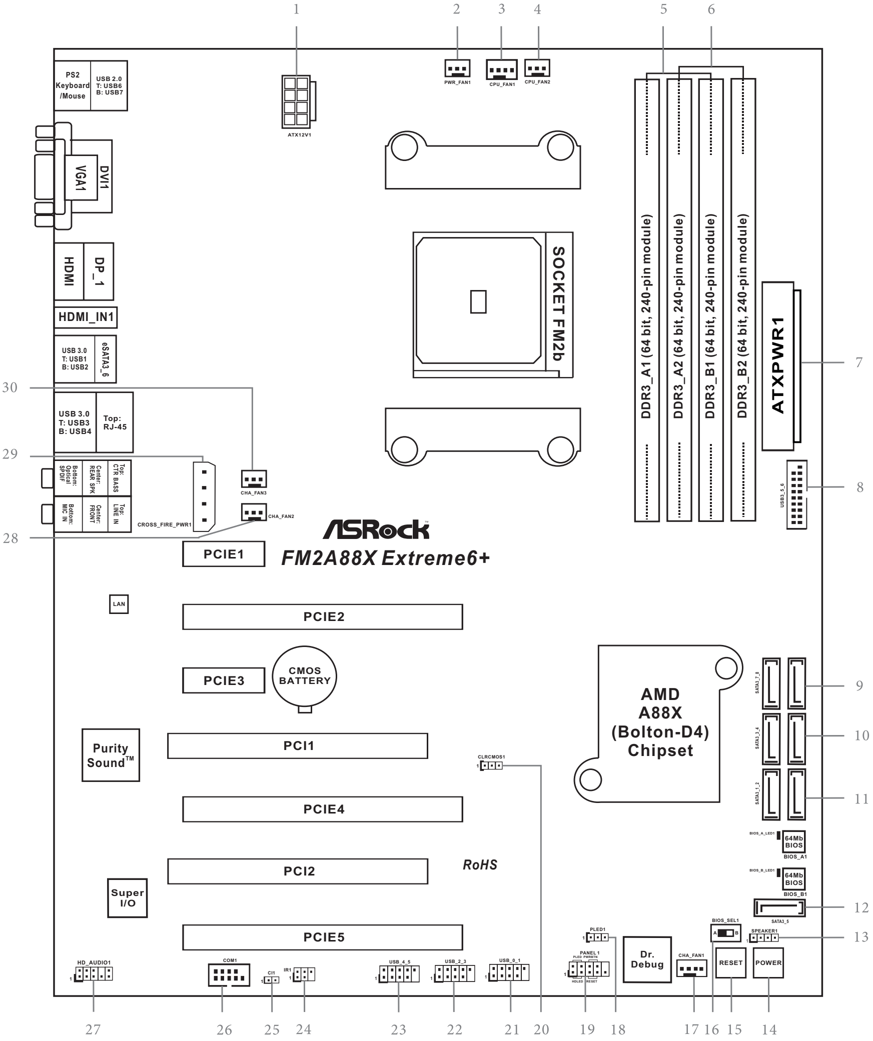
ASRock USB Key

In a world where time is money, why waste precious time everyday typing usernames to log in to Windows? Why should we even bother memorizing those foot long passwords? Just plug in the USB Key and let your computer log in to windows automatically!

ASRock FAN-Tastic Tuning

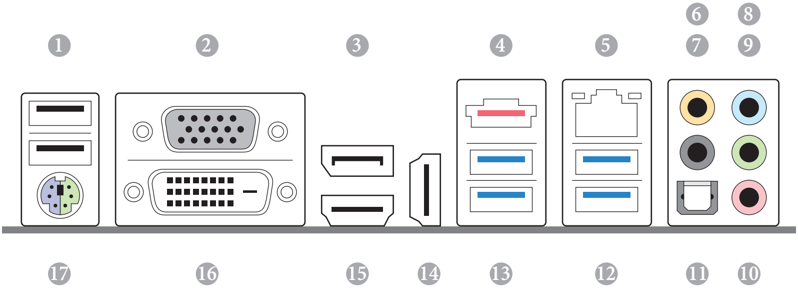
ASRock FAN-Tastic Tuning is included in A-Tuning. Configure up to five different fan speeds using the graph. The fans will automatically shift to the next speed level when the assigned temperature is met.

1.4 Motherboard Layout


1
2
3
4
5
6
PS2 Keyboard /Mouse
USB 2.0 T: USB6 B: USB7
ATX12V1
PWR_FAN1
CPU_FAN1
CPU_FAN2
VGA1
DVI1
HDMI
DP_1
HDMI_IN1
USB 3.0 T: USB1 B: USB2
eSATA3_6
SOCKET FM2b
DDR3_A1 (64 bit, 240-pin module)
DDR3_A2 (64 bit, 240-pin module)
DDR3_B1 (64 bit, 240-pin module)
DDR3_B2 (64 bit, 240-pin module)
ATXPWR1
7
30
USB 3.0 T: USB3 B: USB4
Top: RJ-45
29
Bottom: Optical SPDIF
Center: REAR SPK
Top: CTR BASS
Bottom: MIC IN
Center: FRONT
Top: LINE IN
CROSS_FIRE_PWR1
CHA_FAN3
CHA_FAN2
USB3_5_6
8
28
ASRock
FM2A88X Extreme6+
PCIE1
LAN
PCIE2
PCIE3
CMOS BATTERY
AMD A88X (Bolton-D4) Chipset
SATA3_7_8
9
SATA3_3_4
10
SATA3_1_2
11
Purity Sound™
PCI1
CLRCMOS1
PCIE4
BIOS_A_LED1
64Mb BIOS
BIOS_A1
RoHS
PCI2
BIOS_B_LED1
64Mb BIOS
BIOS_B1
Super I/O
SATA3_5
12
BIOS_SEL1
A
B
SPEAKER1
13
PCIE5
PLED1
PANEL1
PLED PWRBTN
HDLED RESET
Dr. Debug
CHA_FAN1
RESET
POWER
HD_AUDIO1
COM1
CI1
IR1
USB_4_5
USB_2_3
USB_0_1
27
26
25
24
23
22
21
20
19
18
17
16
15
14

No.	Description
1	ATX 12V Power Connector (ATX12V1)
2	Power Fan Connector (PWR_FAN1)
3	CPU Fan Connector (CPU_FAN1)
4	CPU Fan Connector (CPU_FAN2)
5	2 x 240-pin DDR3 DIMM Slots (DDR3_A1, DDR3_B1)
6	2 x 240-pin DDR3 DIMM Slots (DDR3_A2, DDR3_B2)
7	ATX Power Connector (ATXPWR1)
8	USB 3.0 Header (USB3_5_6)
9	SATA3 Connectors (SATA3_7_8)
10	SATA3 Connectors (SATA3_3_4)
11	SATA3 Connectors (SATA3_1_2)
12	SATA3 Connector (SATA3_5)
13	Chassis Speaker Header (SPEAKER1)
14	Power Switch (PWRBTN1)
15	Reset Switch (RSTBTN1)
16	BIOS Selection Switch (BIOS_SEL1)
17	Chassis Fan Connector (CHA_FAN1)
18	Power LED Header (PLED1)
19	System Panel Header (PANEL1)
20	Clear CMOS Jumper (CLRCMOS1)
21	USB 2.0 Header (USB_0_1)
22	USB 2.0 Header (USB_2_3)
23	USB 2.0 Header (USB_4_5)
24	Infrared Module Header (IR1)
25	Chassis Intrusion Header (CI1)
26	COM Port Header (COM1)
27	Front Panel Audio Header (HD_AUDIO1)
28	Chassis Fan Connector (CHA_FAN2)
29	XFire Power Connector (CROSS_FIRE_PWR1)
30	Chassis Fan Connector (CHA_FAN3)

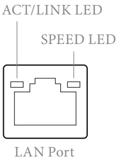
1.5 I/O Panel



No.	Description	No.	Description
1	USB 2.0 Ports (USB_6_7)*	10	Microphone (Pink)
2	D-Sub Port	11	Optical SPDIF Out Port
3	DisplayPort (DP_1)	12	USB 3.0 Ports (USB3_34) (AMD A88X (Bolton-D4))
4	eSATA Connector	13	USB 3.0 Ports (USB3_1_2) (ASMedia ASM1042)
5	LAN RJ-45 Port**	14	HDMI-In Port
6	Central / Bass (Orange)	15	HDMI-Out Port
7	Rear Speaker (Black)	16	DVI-D Port
8	Line In (Light Blue)	17	PS/2 Mouse/Keyboard Port
9	Front Speaker (Lime)***		

** It is recommended to install the USB Keyboard/Mouse cable to USB 2.0 ports (USB_6_7) instead of USB 3.0 ports.*

*** There are two LEDs on the LAN port. Please refer to the table below for the LAN port LED indications.*



Activity / Link LED	
Status	**Description**
Off	No Link
Blinking	Data Activity
On	Link

Speed LED	
Status	**Description**
Off	10Mbps connection
Orange	100Mbps connection
Green	1Gbps connection

**** If you use a 2-channel speaker, please connect the speaker's plug into "Front Speaker Jack". See the table below for connection details in accordance with the type of speaker you use.*

Audio Output Channels	Front Speaker (No. 9)	Rear Speaker (No. 7)	Central / Bass (No. 6)	Line In or Side Speaker (No. 8)
2	V	--	--	--
4	V	V	--	--
6	V	V	V	--
8	V	V	V	V

To enable Multi-Streaming, you need to connect a front panel audio cable to the front panel audio header. After restarting your computer, you will find the "Mixer" tool on your system. Please select "Mixer ToolBox" , click "Enable playback multi-streaming", and click "ok". Choose "2CH", "4CH", "6CH", or "8CH" and then you are allowed to select "Realtek HDA Primary output" to use the Rear Speaker, Central/Bass, and Front Speaker, or select "Realtek HDA Audio 2nd output" to use the front panel audio.

2. Installation

This is an ATX form factor motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

Pre-installation Precautions

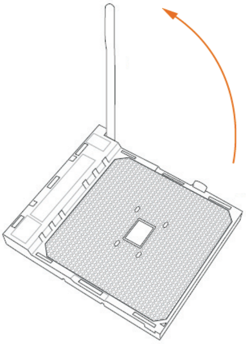
Take note of the following precautions before you install motherboard components or change any motherboard settings.

> Before you install or remove any component, ensure that the power is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

1. Unplug the power cord from the wall socket before touching any component.
2. To avoid damaging the motherboard components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before you handle components.
3. Hold components by the edges and do not touch the ICs.
4. Whenever you uninstall any component, place it on a grounded anti-static pad or in the bag that comes with the component.
5. When placing screws into the screw holes to secure the motherboard to the chassis, please do not over-tighten the screws! Doing so may damage the motherboard.

2.1 CPU Installation

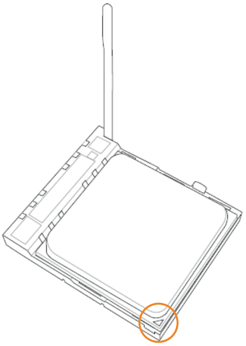
Step 1. Unlock the socket by lifting the lever up to a 90° angle.



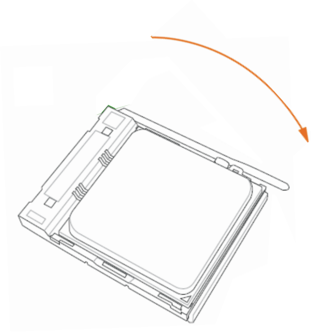
Step 2. Position the CPU directly above the socket such that the CPU corner with the golden triangle matches the socket corner with a small triangle.

Step 3. Carefully insert the CPU into the socket until it fits in place.

The CPU fits only in one correct orientation. DO NOT force the CPU into the socket to avoid bending of the pins.



Step 4. When the CPU is in place, press it firmly on the socket while you push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.



2.2 Installation of CPU Fan and Heatsink

After you install the CPU into this motherboard, it is necessary to install a larger heatsink and cooling fan to dissipate heat. You also need to spray thermal grease between the CPU and the heatsink to improve heat dissipation. Make sure that the CPU and the heatsink are securely fastened and in good contact with each other. Then connect the CPU fan to the CPU FAN connector (CPU_FAN1, see Page 10, No. 3 or CPU_FAN2, see Page 10, No. 4). For proper installation, please kindly refer to the instruction manuals of the CPU fan and the heatsink.

2.3 Installation of Memory Modules (DIMM)

This motherboard provides four 240-pin DDR3 (Double Data Rate 3) DIMM slots, and supports Dual Channel Memory Technology.

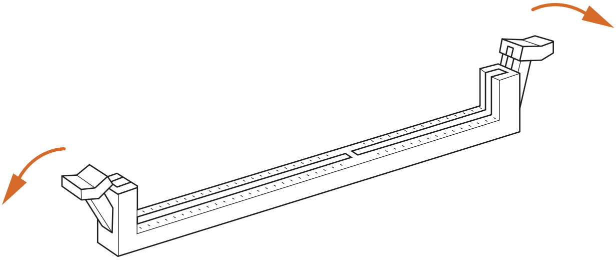
1. *For dual channel configuration, you always need to install identical (the same brand, speed, size and chip-type) DDR3 DIMM pairs.*
2. *It is unable to activate Dual Channel Memory Technology with only one or three memory module installed.*
3. *It is not allowed to install a DDR or DDR2 memory module into a DDR3 slot; otherwise, this motherboard and DIMM may be damaged.*
4. *If you adopt DDR3 2600/2400/2133/1866/1600 memory modules on this motherboard, it is recommended to install them on DDR3_A2 and DDR3_B2 slots.*

Dual Channel Memory Configuration

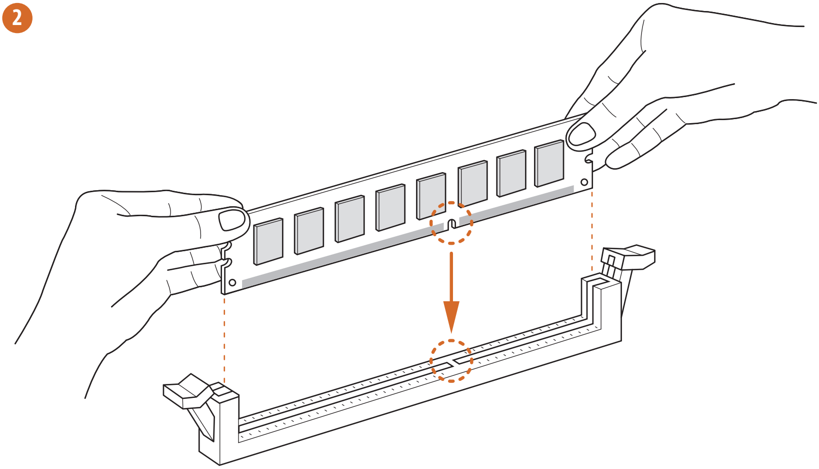
Priority	DDR3_A1	DDR3_A2	DDR3_B1	DDR3_B2
1	Populated		Populated	
2		Populated		Populated
3	Populated	Populated	Populated	Populated

The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation.

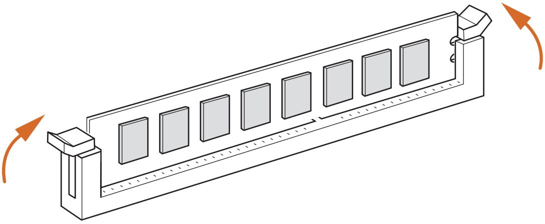
①



②



③



2.4 Expansion Slots (PCI and PCI Express Slots)

There are 2 PCI slots and 5 PCI Express slots on this motherboard.

Before installing an expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.

PCI Slots: PCI slots are used to install expansion cards that have the 32-bit PCI interface.

PCIE Slots:

PCIE1 / PCIE3 (PCIe 2.0 x1 slot) is used for PCI Express cards with x1 lane width cards.

PCIE2 / PCIE4 (PCIe 3.0 x16 slot) is used for PCI Express x16 lane width graphics cards.

PCIE5 (PCIe 2.0 x16 slot) is used for PCI Express x4 lane width cards.

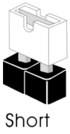
PCIe Slot Configurations

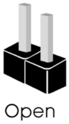
	PCIE2	PCIE4	PCIE5
Single Graphics Card	x16	N/A	N/A
Two Graphics Cards in CrossFireX™ Mode	x8	x8	N/A
Three Graphics Cards in 3-Way CrossFireX™ Mode	x8	x8	x4

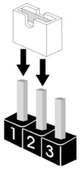
1. *For a better thermal environment, please connect a chassis fan to the motherboard's chassis fan connector (CHA_FAN1, CHA_FAN2 or CHA_FAN3) when using multiple graphics cards.*
2. *When PCIE2 slot is occupied, the DisplayPort cannot be used.*
3. *If you use DisplayPort, PCIE2 slot cannot run at x16 lane width, only work at max x8 lane width.*

2.5 Jumpers Setup

The illustration shows how jumpers are setup. When the jumper cap is placed on pins, the jumper is “Short”. If no jumper cap is placed on pins, the jumper is “Open”. The illustration shows a 3-pin jumper whose pin1 and pin2 are “Short” when jumper cap is placed on these 2 pins.







Jumper	Setting		Description
Clear CMOS Jumper (CLRCMOS1) (see p.10, No. 20)	1_2 ●●○ Default	2_3 ○●● Clear CMOS	

Note: CLRCMOS1 allows you to clear the data in CMOS. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short pin2 and pin3 on CLRCMOS1 for 5 seconds. However, please do not clear the CMOS right after you update the BIOS. If you need to clear the CMOS when you just finish updating the BIOS, you must boot up the system first, and then shut it down before you do the clear-CMOS action. Please be noted that the password, date, time, user default profile, 1394 GUID and MAC address will be cleared only if the CMOS battery is removed.

If you clear the CMOS, the case open may be detected. Please adjust the BIOS option “Clear Status” to clear the record of previous chassis intrusion status.

2.6 Onboard Headers and Connectors

Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage of the motherboard!

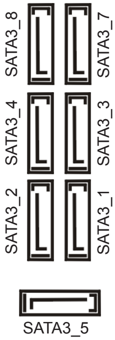
Serial ATA3 Connectors

(SATA3_1_2: see p.10, No. 11)

(SATA3_3_4: see p.10, No. 10)

(SATA3_7_8: see p.10, No. 9)

(SATA3_5: see p.10, No. 12)

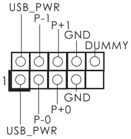

SATA3_8
SATA3_7
SATA3_4
SATA3_3
SATA3_2
SATA3_1
SATA3_5

These seven Serial ATA3 (SATA3) connectors support SATA data cables for internal storage devices. The current SATA3 interface allows up to 6.0 Gb/s data transfer rate.

USB 2.0 Headers

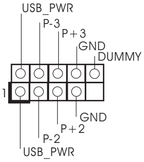
(9-pin USB_0_1)

(see p.10 No. 21)


USB_PWR
P-1
P+1
GND
DUMMY
1
GND
P+0
P-0
USB_PWR

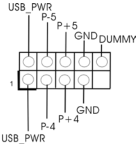
(9-pin USB_2_3)

(see p.10 No. 22)


USB_PWR
P-3
P+3
GND
DUMMY
1
GND
P+2
P-2
USB_PWR

(9-pin USB_4_5)

(see p.10 No. 23)

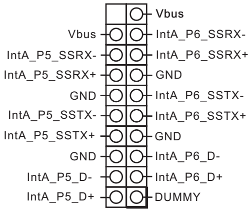

USB_PWR
P-5
P+5
GND
DUMMY
1
GND
P+4
P-4
USB_PWR

Besides two default USB 2.0 ports on the I/O panel, there are three USB 2.0 headers on this motherboard. Each USB 2.0 header can support two USB 2.0 ports.

USB 3.0 Header

(19-pin USB3_5_6)

(see p.10, No. 8)

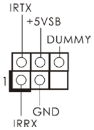

Vbus
Vbus
IntA_P6_SSRX-
IntA_P5_SSRX-
IntA_P6_SSRX+
IntA_P5_SSRX+
GND
GND
IntA_P6_SSTX-
IntA_P5_SSTX-
IntA_P6_SSTX+
IntA_P5_SSTX+
GND
GND
IntA_P6_D-
IntA_P5_D-
IntA_P6_D+
IntA_P5_D+
DUMMY

Besides four default USB 3.0 ports on the I/O panel, there is one USB 3.0 header on this motherboard. This USB 3.0 header can support two USB 3.0 ports.

Infrared Module Header

(5-pin IR1)

(see p.10 No. 24)

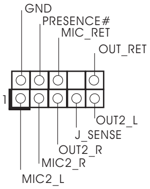

IRTX
+5VSB
DUMMY
1
GND
IRRX

This header supports an optional wireless transmitting and receiving infrared module.

Front Panel Audio Header

(9-pin HD_AUDIO1)

(see p.10 No. 27)


GND
PRESENCE#
MIC_RET
OUT_RET
1
OUT2_L
J_SENSE
OUT2_R
MIC2_R
MIC2_L

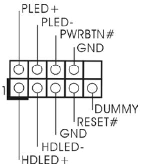
This is an interface for the front panel audio cable that allows convenient connection and control of audio devices.

1. High Definition Audio supports Jack Sensing, but the panel wire on the chassis must support HDA to function correctly. Please follow the instruction in our manual and chassis manual to install your system.
2. If you use AC’97 audio panel, please install it to the front panel audio header as below:
   A. Connect Mic_IN (MIC) to MIC2_L.
   B. Connect Audio_R (RIN) to OUT2_R and Audio_L (LIN) to OUT2_L.
   C. Connect Ground (GND) to Ground (GND).
   D. MIC_RET and OUT_RET are for HD audio panel only. You don’t need to connect them for AC’97 audio panel.
   E. To activate the front mic.
   For Windows® 8 / 8 64-bit / 7 / 7 64-bit 64-bit OS:
   Go to the "FrontMic" Tab in the Realtek Control panel. Adjust “Recording Volume”.

System Panel Header

(9-pin PANEL1)

(see p.10 No. 19)


PLED+
PLED-
PWRBTN#
GND
1
DUMMY
RESET#
GND
HDLED-
HDLED+

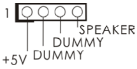
This header accommodates several system front panel functions.

Connect the power switch, reset switch and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.

PWRBTN (Power Switch):
Connect to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch.
RESET (Reset Switch):
Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.
PLED (System Power LED):
Connect to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED keeps blinking when the sys-tem is in S1 sleep state. The LED is off when the system is in S3/S4 sleep state or powered off (S5).
HDLED (Hard Drive Activity LED):
Connect to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.

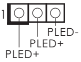
The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assign-ments are matched correctly.

Chassis Speaker Header
(4-pin SPEAKER 1)
(see p.10 No. 13)



Please connect the chassis speaker to this header.

Power LED Header
(3-pin PLED1)
(see p.10 No. 18)

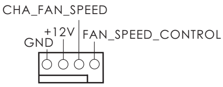


Please connect the chassis power LED to this header to indicate system power status. The LED is on when the system is operating. The LED keeps blinking in S1 state. The LED is off in S3/S4 state or S5 state (power off).

Chassis and Power Fan Connectors

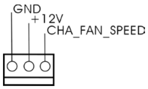
(4-pin CHA_FAN1)

(see p.10 No. 17)


CHA_FAN_SPEED
+12V
GND
FAN_SPEED_CONTROL

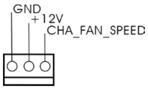
(3-pin CHA_FAN2)

(see p.10 No. 28)


GND
+12V
CHA_FAN_SPEED

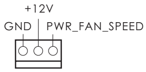
(3-pin CHA_FAN3)

(see p.10 No. 30)


GND
+12V
CHA_FAN_SPEED

(3-pin PWR_FAN1)

(see p.10 No. 2)

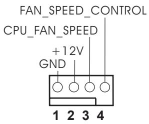

+12V
GND
PWR_FAN_SPEED

Please connect the fan cables to the fan connectors and match the black wire to the ground pin. CHA_FAN1/2/3 fan speed can be controlled through UEFI or A-Tuning.

CPU Fan Connectors

(4-pin CPU_FAN1)

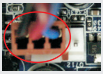
(see p.10 No. 3)


FAN_SPEED_CONTROL
CPU_FAN_SPEED
+12V
GND
1 2 3 4

Please connect the CPU fan cable to the connector and match the black wire to the ground pin.

Though this motherboard provides 4-Pin CPU fan (Quiet Fan) support, the 3-Pin CPU fan still can work successfully even without the fan speed control function. If you plan to connect the 3-Pin CPU fan to the CPU fan connector on this motherboard, please connect it to Pin 1-3.

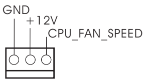
Pin 1-3 Connected ←



3-Pin Fan Installation

(3-pin CPU_FAN2)

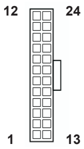
(see p.10 No. 4)


GND
+12V
CPU_FAN_SPEED

ATX Power Connector

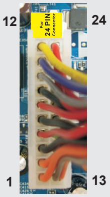
(24-pin ATXPWR1)

(see p.10 No. 7)



Please connect an ATX power supply to this connector.

Though this motherboard provides 24-pin ATX power connector, it can still work if you adopt a traditional 20-pin ATX power supply. To use the 20-pin ATX power supply, please plug your power supply along with Pin 1 and Pin 13.

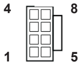


20-Pin ATX Power Supply Installation

ATX 12V Power Connector

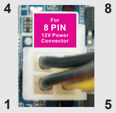
(8-pin ATX12V1)

(see p.10 No. 1)



Please connect an ATX 12V power supply to this connector.

Though this motherboard provides 8-pin ATX 12V power connector, it can still work if you adopt a traditional 4-pin ATX 12V power supply. To use the 4-pin ATX power supply, please plug your power supply along with Pin 1 and Pin 5.

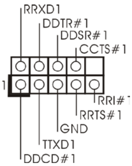

4
8
For
8 PIN
12V Power
Connector
1
5

4-Pin ATX 12V Power Supply Installation

Serial port Header

(9-pin COM1)

(see p.10 No. 26)

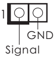

RRXD1
DDTR#1
DDSR#1
CCTS#1
1
RRI#
RRTS#1
GND
TTXD1
DDCD#1

This COM1 header supports a serial port module.

Chassis Intrusion Header

(2-pin CI1)

(see p.10, No. 25)

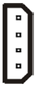

1
GND
Signal

This motherboard supports CASE OPEN detection feature that detects if the chassis cover has been removed. This feature requires a chassis with chassis intrusion detection design.

XFire Power Connector

(4-pin CROSS_FIRE_PWR1)

(see p.10 No. 29)

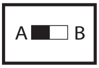


CROSS_FIRE_PWR1

It is not necessary to use this connector, but please connect it with a hard disk power connecor when two graphics cards are plugged to this motherboard.

2.7 Smart Switches

The motherboard has three smart switches: Power Switch, Reset Switch and BIOS Selection Switch.

Power Switch (PWRBTN) (see p.10 No. 14)		Power Switch allows users to quickly turn on/off the system.
Reset Switch (RSTBTN) (see p.10 No. 15)		Reset Switch allows users to quickly reset the system.
BIOS Selection Switch (BIOS_SEL1) (see p.10 No. 16)		BIOS Selection Switch allows the system to boot from either BIOS A or BIOS B.

This motherboard has two BIOS chips, a primary BIOS (BIOS_A) and a backup BIOS (BIOS_B), which enhances the safety and stability of your system. Normally, the system will work on the primary BIOS. However, if the primary BIOS is corrupted or damaged, just flip the BIOS Selection Switch to "B", then the backup BIOS will take over on the next system boot. After that, use "Secure Backup UEFI" in the UEFI Setup Utility to duplicate a working copy of the BIOS files to the primary BIOS to ensure normal system operation. For safety issues, users are not able to update the backup BIOS manually. Users may refer to the BIOS LEDs (BIOS_A_LED or BIOS_B_LED) to identify which BIOS is currently activated.

2.8 Dr. Debug

Dr. Debug is used to provide code information, which makes troubleshooting even easier. Please see the diagrams below for reading the Dr. Debug codes.

Code	Description
00	Please check if the CPU is installed correctly and then clear CMOS.
0d	Problem related to memory, VGA card or other devices. Please clear CMOS, re-install the memory and VGA card, and remove other USB, PCI devices.
01 - 54 (except 0d), 5A- 60	Problem related to memory. Please re-install the CPU and memory then clear CMOS. If the problem still exists, please install only one memory module or try using other memory modules.
55	The Memory could not be detected. Please re-install the memory and CPU. If the problem still exists, please install only one memory module or try using other memory modules.
61 - 91	Chipset initialization error. Please press reset or clear CMOS.
92 - 99	Problem related to PCI-E devices. Please re-install PCI-E devices or try installing them in other slots. If the problem still exists, please remove all PCI-E devices or try using another VGA card.
A0 - A7	Problem related to IDE or SATA devices. Please re-install IDE and SATA devices. If the problem still exists, please clear CMOS and try removing all SATA devices.

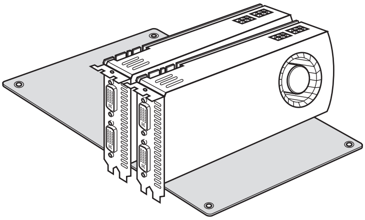
b0	Problem related to memory. Please re-install the CPU and memory. If the problem still exists, please install only one memory module or try using other memory modules.
b4	Problem related to USB devices. Please try removing all USB devices.
b7	Problem related to memory. Please re-install the CPU and memory then clear CMOS. If the problem still exists, please install only one memory module or try using other memory modules.
d6	The VGA could not be recognized. Please clear CMOS and try re-installing the VGA card. If the problem still exists, please try installing the VGA card in other slots or use other VGA cards.
d7	The Keyboard and mouse could not be recognized. Please try re-installing the keyboard and mouse.
d8	Invalid Password.
FF	Please check if the CPU is installed correctly and then clear CMOS.

2.9 CrossFireX™, 3-Way CrossFireX™ and Quad CrossFireX™ Operation Guide

This motherboard supports CrossFireX™, 3-way CrossFireX™ and Quad CrossFireX™ that allows you to install up to three identical PCI Express x16 graphics cards. Currently CrossFireX™, 3-way CrossFireX™ and Quad CrossFireX™ are supported with Windows® 7 / 7 64-bit / 8 / 8 64-bit OS.

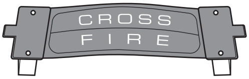
1. *You should only use identical CrossFireX™-ready graphics cards that are AMD certified.*
2. *Make sure that your graphics card driver supports AMD CrossFireX™ technology. Download the drivers from the AMD's website: www.amd.com*
3. *Make sure that your power supply unit (PSU) can provide at least the minimum power your system requires. It is recommended to use a AMD certified PSU. Please refer to the AMD's website for details.*
4. *If you pair a 12-pipe CrossFireX™ Edition card with a 16-pipe card, both cards will operate as 12-pipe cards while in CrossFireX™ mode.*
5. *Different CrossFireX™ cards may require different methods to enable CrossFireX™. Please refer to AMD graphics card manuals for detailed installation guide.*

2.9.1 Installing Two CrossFireX™-Ready Graphics Cards

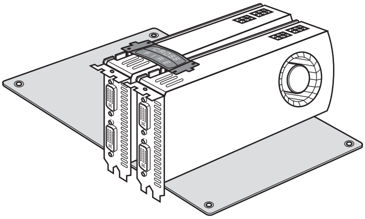


Step 1

Insert one graphics card into PCIE2 slot and the other graphics card to PCIE4 slot. Make sure that the cards are properly seated on the slots.

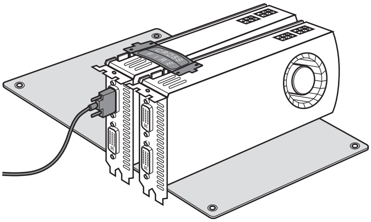


CrossFire Bridge



Step 2

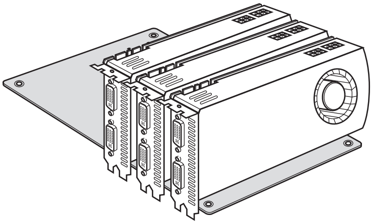
Connect two graphics cards by installing a CrossFire Bridge on the CrossFire Bridge Interconnects on the top of the graphics cards. (The CrossFire Bridge is provided with the graphics card you purchase, not bundled with this motherboard. Please refer to your graphics card vendor for details.)



Step 3

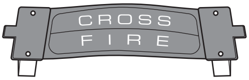
Connect a VGA cable or a DVI cable to the monitor connector or the DVI connector of the graphics card that is inserted to PCIE2 slot.

2.9.2 Installing Three CrossFireX$^{\text{TM}}$-Ready Graphics Cards



Step 1

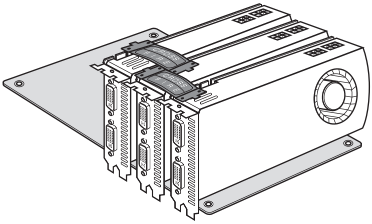
Insert one graphics card into PCIE2 slot, another graphics card to PCIE4 slot, and the other graphics card to PCIE5 slot. Make sure that the cards are properly seated on the slots.

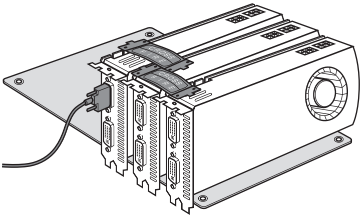


CrossFire Bridge

Step 2

Use one CrossFire Bridge to connect the graphics cards on PCIE2 and PCIE4 slots, and use the other CrossFire Bridge to connect the graphics cards on PCIE4 and PCIE5 slots. (The CrossFire Bridge is provided with the graphics card you purchase, not bundled with this motherboard. Please refer to your graphics card vendor for details.)





Step 3

Connect a VGA cable or a DVI cable to the monitor connector or the DVI connector of the graphics card that is inserted to PCIE2 slot.

2.9.3 Driver Installation and Setup

Step 1

Power on your computer and boot into OS.

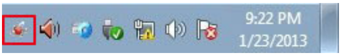
Step 2

Remove the AMD drivers if you have any VGA drivers installed in your system.

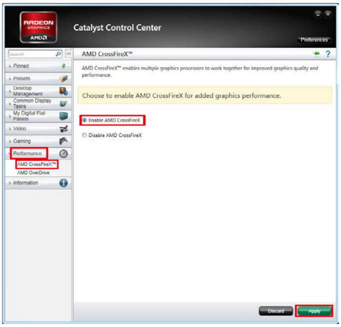
The Catalyst Uninstaller is an optional download. We recommend using this utility to uninstall any previously installed Catalyst drivers prior to installation. Please check AMD's website for AMD driver updates.

Step 3

Install the required drivers and CATALYST Control Center then restart your computer. Please check AMD's website for details.


9:22 PM
1/23/2013

AMD Catalyst Control Center


RADEON GRAPHICS
AMD
Catalyst Control Center
Preferences
Search
Pinned
Presets
Desktop Management
Common Display Tasks
My Digital Flat-Panels
Video
Gaming
Performance
AMD CrossFireX™
AMD OverDrive
Information
Discard
Apply

AMD CrossFireX™

AMD CrossFireX™ enables multiple graphics processors to work together for improved graphics quality and performance.

Choose to enable AMD CrossFireX for added graphics performance.

● Enable AMD CrossFireX

○ Disable AMD CrossFireX

Step 4

Double-click the **AMD Catalyst Control Center** icon in the Windows® system tray.

Step 5

In the left pane, click **Performance** and then **AMD CrossFireX™**. Then select **Enable AMD CrossFireX** and click **Apply**. Select the GPU number according to your graphics card and click **Apply**.

2.10 AMD Dual Graphics Operation Guide

This motherboard supports AMD Dual Graphics feature. AMD Dual Graphics brings multi-GPU performance capabilities by enabling an AMD A88X (Bolton-D4) integrated graphics processor and a discrete graphics processor to operate simultaneously with combined output to a single display for blisteringly-fast frame rates. Currently, AMD Dual Graphics Technology is only supported with Windows® 8 / 7 OS.

What does an AMD Dual Graphics system include?

An AMD Dual Graphics system includes an AMD Radeon HD 8000/7000 graphics processor and a motherboard based on an AMD A88X (Bolton-D4) integrated chipset, all operating in a Windows® 8 / 7 environment. Please refer to AMD website for further information.

Enjoy the benefit of AMD Dual Graphics

Step 1. Please keep the default UEFI setting of “Dual Graphics“ option on [Auto].

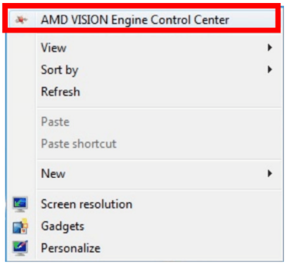
Step 2. Install one AMD RADEON PCI Express graphics card to PCIE2 slot.

Step 3. Connect the monitor cable to the onboard VGA port. Please be noted that the current VGA driver / VBIOS can allow Dual Graphics output from onboard display only. For any future update, please refer to our website for further information.

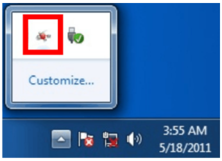
Step 4. Boot into OS. Please remove the AMD driver if you have any VGA driver installed in your system.

Step 5. Install the onboard VGA driver from our support CD to your system for both the onboard VGA and the discrete graphics card.

Step 6. Restart your computer. Right-click the desktop. Click “AMD VISION Engine Control Center” to enter AMD VISION Engine Control Center.

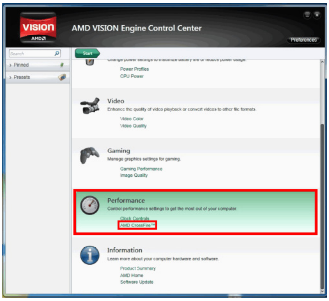


Step 7. You can also click “AMD VISION Engine Control Center” on your Windows® taskbar to enter AMD VISION Engine Control Center.


Customize...
3:55 AM
5/18/2011

AMD VISION Engine Control Center

Step 8. In AMD VISION Engine Control Center, please choose “Performance”. Click “AMD CrossFire™”.


VISION
AMD
AMD VISION Engine Control Center
Preferences
Search
Pinned
Presets
Start
Power Profiles
CPU Power
Video
Video Color
Video Quality
Gaming
Gaming Performance
Image Quality
Performance
Clock Controls
AMD CrossFire™
Information
Product Summary
AMD Home
Software Update

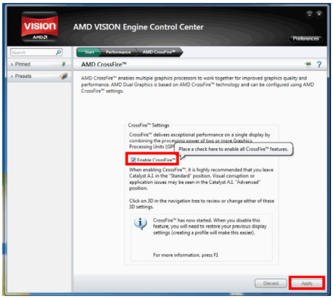
Enhance the quality of video playback or convert videos to other file formats.

Manage graphics settings for gaming.

Control performance settings to get the most out of your computer.

Learn more about your computer hardware and software.

Step 9. Click “Enable CrossFire™” and click “Apply“ to save your change.


VISION
AMD
AMD VISION Engine Control Center
Preferences
Search
Pinned
Presets
Start
Performance
AMD CrossFire™
AMD CrossFire™
?
CrossFire™ Settings
Discard
Apply

AMD CrossFire™ enables multiple graphics processors to work together for improved graphics quality and performance. AMD Dual Graphics is based on AMD CrossFire™ technology and can be configured using AMD CrossFire™ settings.

CrossFire™ delivers exceptional performance on a single display by combining the processing power of two or more Graphics Processing Units (GP

Place a check here to enable all CrossFire™ features.

☑ Enable CrossFire™

When enabling CrossFire™, it is highly recommended that you leave Catalyst A.I. in the "Standard" position. Visual corruption or application issues may be seen in the Catalyst A.I. "Advanced" position.

Click on 3D in the navigation tree to review or change either of these 3D settings.

CrossFire™ has now started. When you disable this feature, you will need to restore your previous display settings (creating a profile will make this easier).

For more information, press F1

Step 10. Reboot your system. Then you can freely enjoy the benefit of Dual Graphics feature.

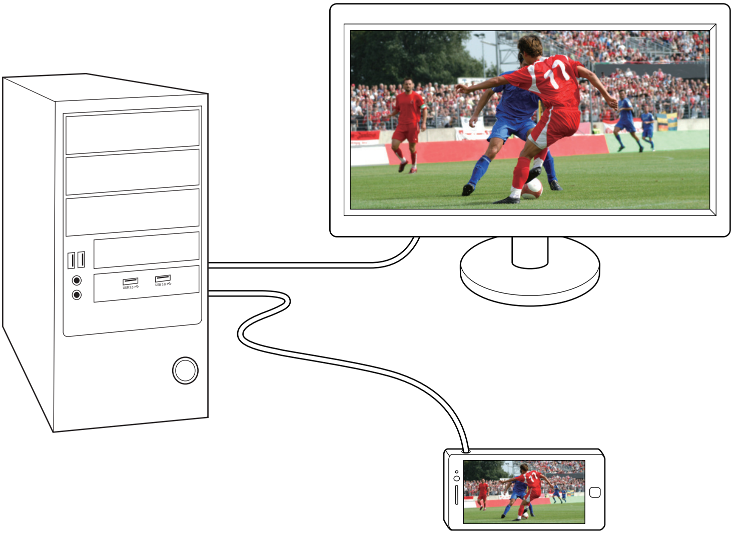
* Dual Graphics appearing here is a registered trademark of AMD Technologies Inc., and is used only for identification or explanation and to the owners’ benefit, without intent to infringe.

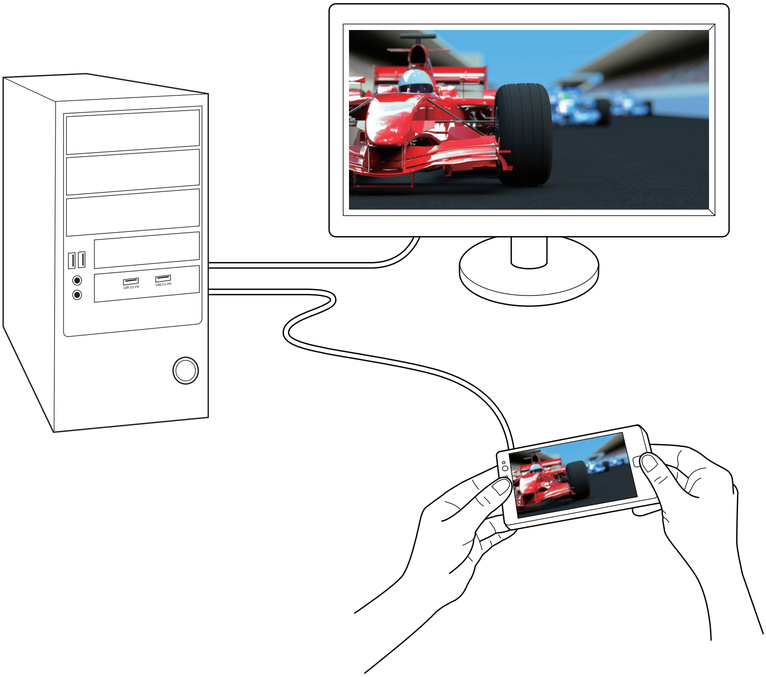
* For further information of AMD Dual Graphics technology, please check AMD website for up dates and details.

2.11 Using the HDMI-In Port

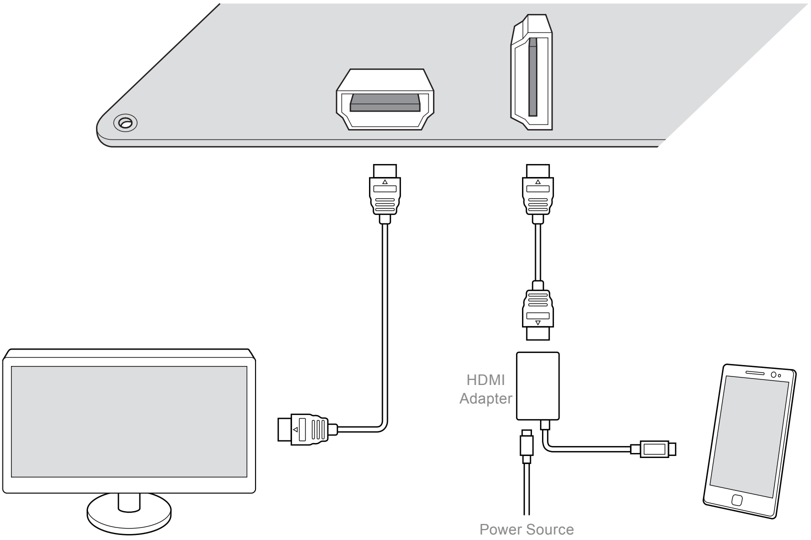
The HDMI-In port on this motherboard lets you easily switch between PC screen (on-board VGA) and external video source on the same monitor. This function saves you the hassle of switching cables back and forth when you want to display the screen of another device, such as smartphone, tablet, camcorder, DVD player, or another PC, onto the PC monitor.

Another useful feature of this function is that external video source can be viewed even when your PC is in standby mode or powered off. For example, you can play smartphone games or watch tablet video on your PC screen.





Connection Diagram


HDMI
Adapter
Power Source

Step 1

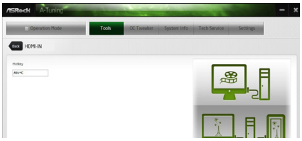
Connect your monitor to the HDMI-Out port on the motherboard via an HDMI cable.

Step 2

Connect an external devices with HDMI output to the HDMI-In port on the motherboard via an HDMI cable.

Step 3

Double-click the “A-Tuning“ icon on the desktop and find "HDMI-IN" function in "Tools" tab.
Drag the switch right or left to enable Onboard (on-board PC screen) or HDMI (HDMI-In Source).


ASRock A-Tuning
Operation Mode
Tools
OC Tweaker
System Info
Tech Service
Settings
Back
HDMI-IN

Hotkey
Alt+C

or

Use the hotkey to switch between on-board PC screen or HDMI-In Source.

To change the hotkey, click the textbox next to “Hotkey:” *and enter the action for the key.*

1. *If there is no video displayed on your monitor, make sure that the cables are properly connected and make sure that “Deep S5” option in BIOS SETUP is set to [Disable].*
2. *If required, connect a power source to the adapter that lets the smart-phone/tablet output HDMI signal.*

3. Software and Utilities Operation

3.1 Installing Drivers

The Support CD that comes with the motherboard contains necessary drivers and useful utilities that enhance the motherboard's features.

Running The Support CD

To begin using the support CD, insert the CD into your CD-ROM drive. The CD automatically displays the Main Menu if "AUTORUN" is enabled in your computer. If the Main Menu does not appear automatically, locate and double click on the file "ASRSETUP.EXE" in the Support CD to display the menu.

Drivers Menu

The drivers compatible to your system will be auto-detected and listed on the support CD driver page. Please click Install All or follow the order from top to bottom to install those required drivers. Therefore, the drivers you install can work properly.

Utilities Menu

The Utilities Menu shows the application software that the motherboard supports. Click on a specific item then follow the installation wizard to install it.

3.2 A-Tuning

A-Tuning is ASRock's multi purpose software suite with a new interface, more new features and improved utilities, including XFast RAM, Dehumidifier, Good Night LED, FAN-Tastic Tuning, OC Tweaker and a whole lot more.

3.2.1 Installing A-Tuning

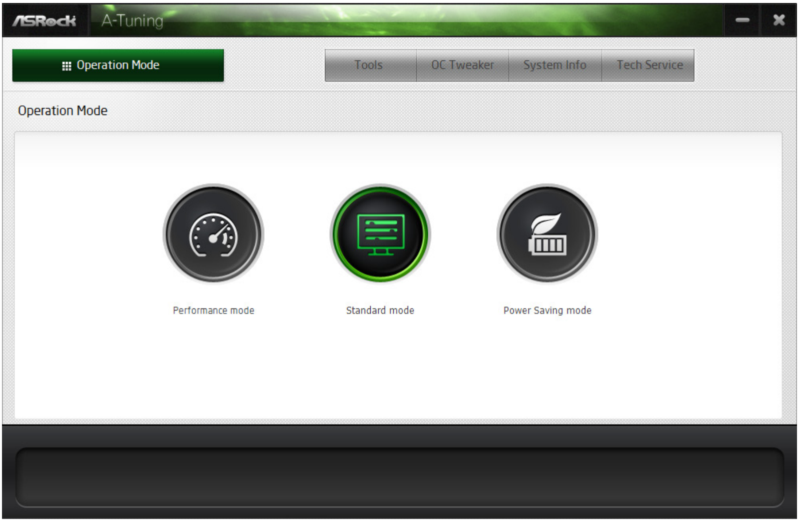
When you install the all-in-one driver to your system from ASRock's support CD, A-Tuning will be auto-installed as well. After the installation, you will find the icon "A-Tuning" on your desktop. Double-click the "A-Tuning" icon, A-Tuning main menu will pop up.

3.2.2 Using A-Tuning

There are five sections in A-Tuning main menu: Operation Mode, Tools, OC Tweaker, System Info and Tech Service.

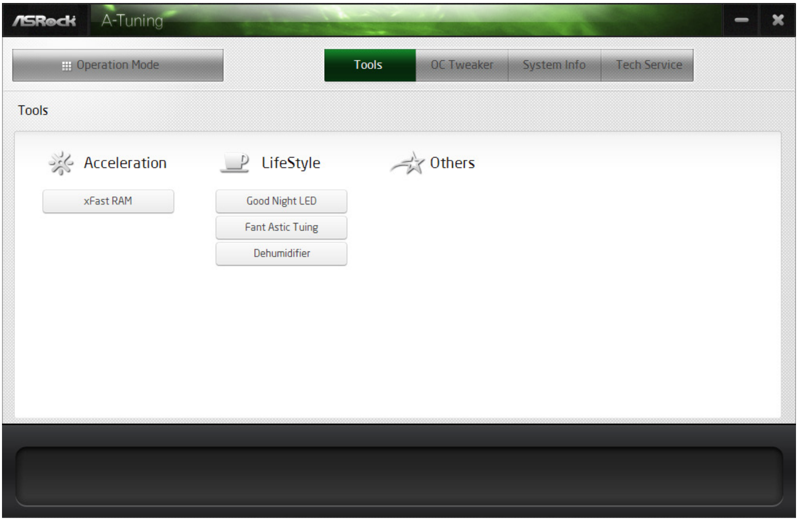
Operation Mode

Choose an operation mode for your computer.


ASRock
A-Tuning
Operation Mode
Tools
OC Tweaker
System Info
Tech Service
Operation Mode
Performance mode
Standard mode
Power Saving mode

Tools

Various tools and utilities.


ASRock
A-Tuning
Operation Mode
Tools
OC Tweaker
System Info
Tech Service
Tools
Acceleration
LifeStyle
Others
xFast RAM
Good Night LED
Fant Astic Tuing
Dehumidifier

XFast RAM

Boost the system's performance and extend the HDD's or SDD's lifespan! Create a hidden partition, then assign which files should be stored in the RAM drive.

Fast Boot

Fast Boot minimizes your computer's boot time. Please note that Ultra Fast mode is only supported by Windows 8 and the VBIOS must support UEFI GOP if you are using an external graphics card.

OMG

Schedule the starting and ending hours of Internet access granted to other users. Place X marks on the time table to disable the Internet.

Good Night LED

Switch off the Power/HDD/LAN LEDs when the system is on, and automatically switch off the Power and Keyboard LEDs when the system enters into Standby/Hibernation mode.

FAN-Tastic Tuning

Configure up to five different fan speeds using the graph. The fans will automatically shift to the next speed level when the assigned temperature is met.

Dehumidifier

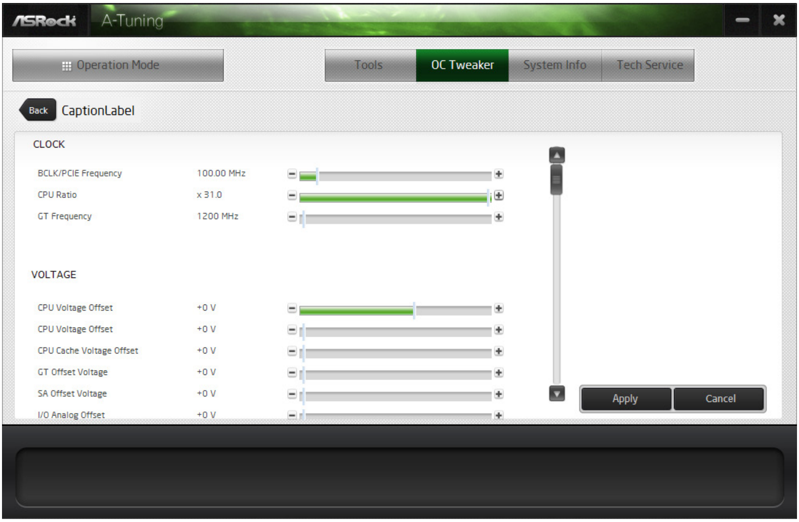
Prevent motherboard damages due to dampness. Enable this function and configure the period of time until the computer powers on, and the duration of the dehumidifying process.

HDMI-IN

Connect two different devices to one monitor and toggle between the primary and secondary screen without replugging the connectors every time. Please set a hotkey for switching between the two devices.

OC Tweaker

Configurations for overclocking the system.


ASRock
A-Tuning
Operation Mode
Tools
OC Tweaker
System Info
Tech Service
Back
CaptionLabel
Apply
Cancel

CLOCK

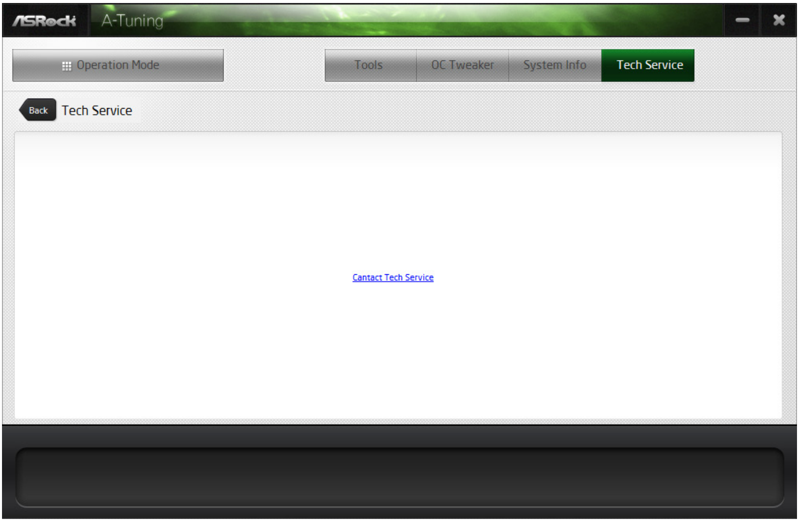
BCLK/PCIE Frequency	100.00 MHz
CPU Ratio	x 31.0
GT Frequency	1200 MHz

VOLTAGE

CPU Voltage Offset	+0 V
CPU Voltage Offset	+0 V
CPU Cache Voltage Offset	+0 V
GT Offset Voltage	+0 V
SA Offset Voltage	+0 V
I/O Analog Offset	+0 V

System Info

View information about the system.


ASRock
A-Tuning
Operation Mode
Tools
OC Tweaker
System Info
Tech Service
Back
Tech Service
Cantact Tech Service

Tech Service

Contact Tech Service.

3.3 Qualcomm® Atheros® Security Wake On Internet Technology

Qualcomm® Atheros® Security Wake On Internet Technology allows you to wake up and remote control your home computer from energy efficient sleep mode.

Before configuring this feature, make sure that the "PCI Device Power On" is enabled in UEFI SETUP UTILITY > Advanced > ACPI Configuration.

3.3.1 Configuring and Using Sunlogin

Oray Sunlogin is a remote control software that lets you easily access and control the remote host that is installed with the Oray SunLogin Client software.

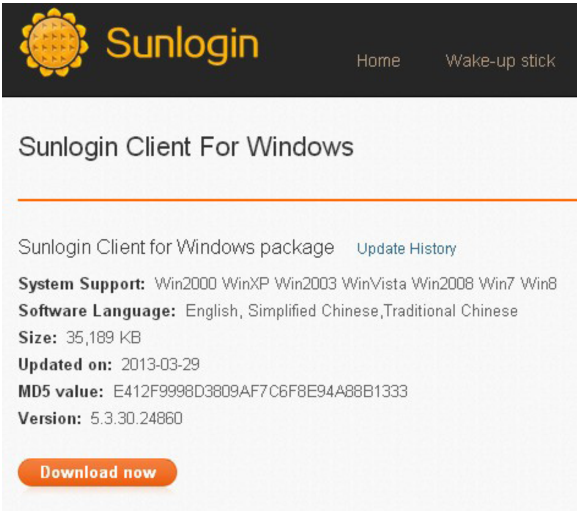
Installing Sunlogin remote client

Step 1

Login to sunlogin.oray.com.
If you have not created a Sunlogin acount, create one.

Step 2

Download "Sunlogin Client" from the Download section of sunlogin.oray.com and execute it.



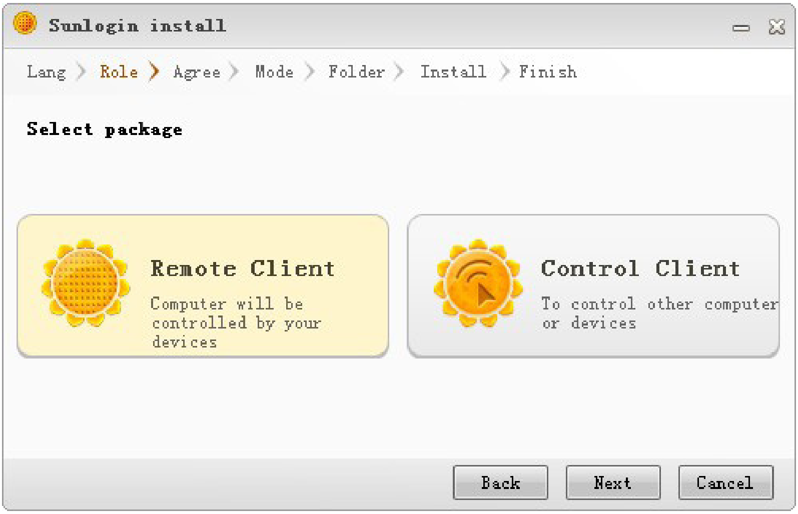
Sunlogin Client For Windows

Sunlogin Client for Windows package

System Support: Win2000 WinXP Win2003 WinVista Win2008 Win7 Win8
Software Language: English, Simplified Chinese,Traditional Chinese
Size: 35,189 KB
Updated on: 2013-03-29
MD5 value: E412F9998D3809AF7C6F8E94A88B1333
Version: 5.3.30.24860

Step 3

Click on Remote Client and follow the onscreen instructions to complete the installation.


Sunlogin install
Lang
Role
Agree
Mode
Folder
Install
Finish
Back
Next
Cancel

Select package

Remote Client
Computer will be controlled by your devices

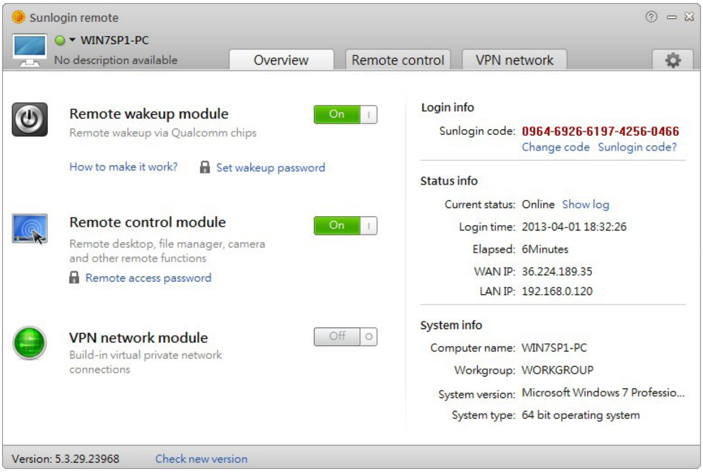
Control Client
To control other computer or devices

Step 4

Double-click the Sunlogin Remote Control icon in the Windows system tray.

Step 5

Make sure that "Remote wakeup module" and "Remote control module" is set to On.


Sunlogin remote
Overview
Remote control
VPN network
How to make it work?
Set wakeup password
Remote access password
Change code
Sunlogin code?
Show log
Check new version

WIN7SP1-PC
No description available

Remote wakeup module On
Remote wakeup via Qualcomm chips

Remote control module On
Remote desktop, file manager, camera and other remote functions

VPN network module Off
Build-in virtual private network connections

Login info

Sunlogin code:	0964-6926-6197-4256-0466

Status info

Current status:	Online
Login time:	2013-04-01 18:32:26
Elapsed:	6Minutes
WAN IP:	36.224.189.35
LAN IP:	192.168.0.120

System info

Computer name:	WIN7SP1-PC
Workgroup:	WORKGROUP
System version:	Microsoft Windows 7 Professio...
System type:	64 bit operating system

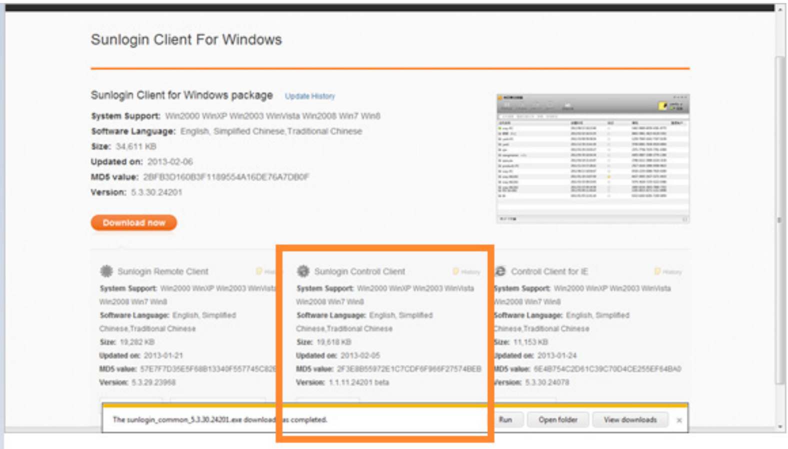
Version: 5.3.29.23968

Installing Sunlogin control client

Step 1

For Windows users:

Download "Control Client" from the Download section of sunlogin.oray.com and execute it. Log-in with your Sunlogin Account and Password.



Sunlogin Client For Windows

Sunlogin Client for Windows package

System Support: Win2000 WinXP Win2003 WinVista Win2008 Win7 Win8
Software Language: English, Simplified Chinese,Traditional Chinese
Size: 34,611 KB
Updated on: 2013-02-06
MD5 value: 2BFB3D160B3F1189554A16DE76A7DB0F
Version: 5.3.30.24201

Sunlogin Remote Client

System Support: Win2000 WinXP Win2003 WinVista Win2008 Win7 Win8
Software Language: English, Simplified Chinese,Traditional Chinese
Size: 19,282 KB
Updated on: 2013-01-21
MD5 value: 57E7F7D35E5F68B13340F557745C82
Version: 5.3.29.23968

Sunlogin Controll Client

System Support: Win2000 WinXP Win2003 WinVista Win2008 Win7 Win8
Software Language: English, Simplified Chinese,Traditional Chinese
Size: 19,618 KB
Updated on: 2013-02-05
MD5 value: 2F3E8B55972E1C7CDF6F966F27574BEB
Version: 1.1.11.24201 beta

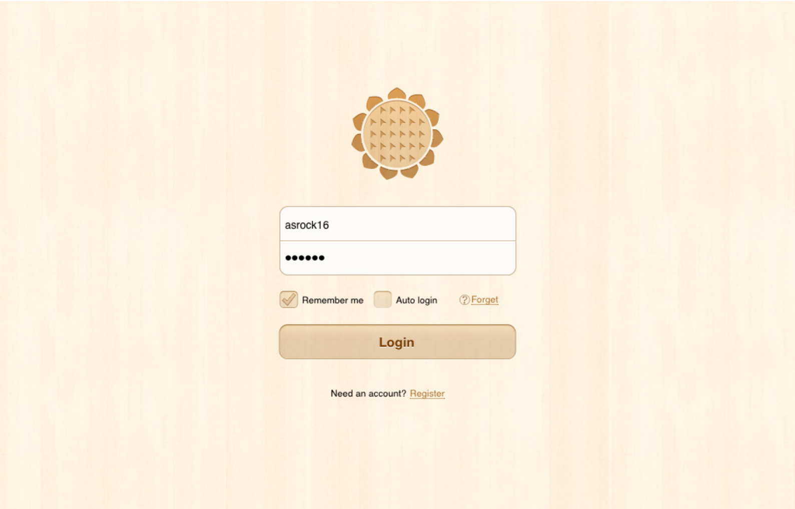
Controll Client for IE

System Support: Win2000 WinXP Win2003 WinVista Win2008 Win7 Win8
Software Language: English, Simplified Chinese,Traditional Chinese
Size: 11,153 KB
Updated on: 2013-01-24
MD5 value: 6E4B754C2D61C39C70D4CE255EF64BA0
Version: 5.3.30.24078

The sunlogin_common_5.3.30.24201.exe download s completed.

For iPad/iPhone users:

Download “Sunlogin” from the App Store and install the app. Then fill in your Sunlogin Account and Password.

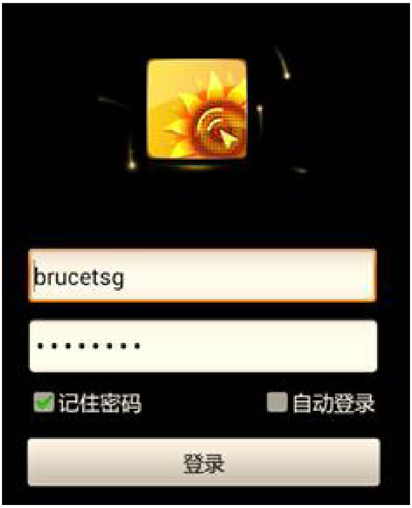


asrock16
••••••

☑ Remember me ☐ Auto login

For Andriod mobile device users:

Search “Sunlogin” in Google PLAY and then install the app. Then fill in your Sunlogin Account and Password.



brucetsg

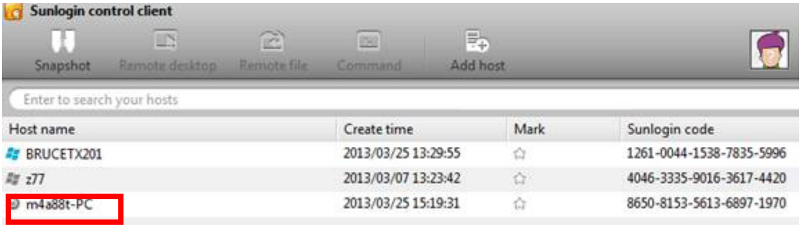
•••••••••

☑ 记住密码 ☐ 自动登录

Using Remote Wakeup

For Windows users:

Select one Host (Offline with Gray power button) on the control client panel to wake up your home computer.

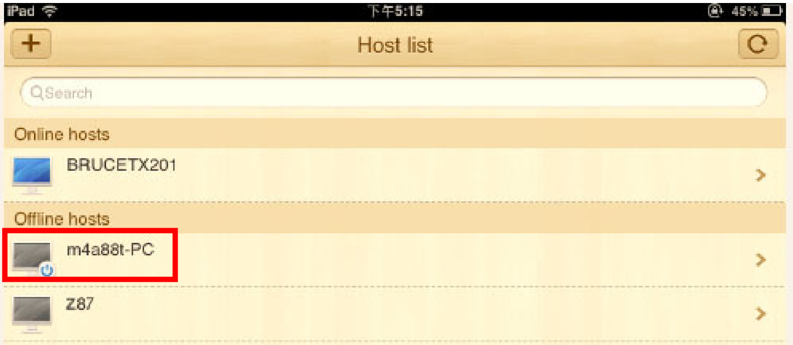


Sunlogin control client
Snapshot
Remote desktop
Remote file
Command
Add host
Enter to search your hosts

Host name	Create time	Mark	Sunlogin code
BRUCETX201	2013/03/25 13:29:55	☆	1261-0044-1538-7835-5996
z77	2013/03/07 13:23:42	☆	4046-3335-9016-3617-4420
m4a88t-PC	2013/03/25 15:19:31	☆	8650-8153-5613-6897-1970

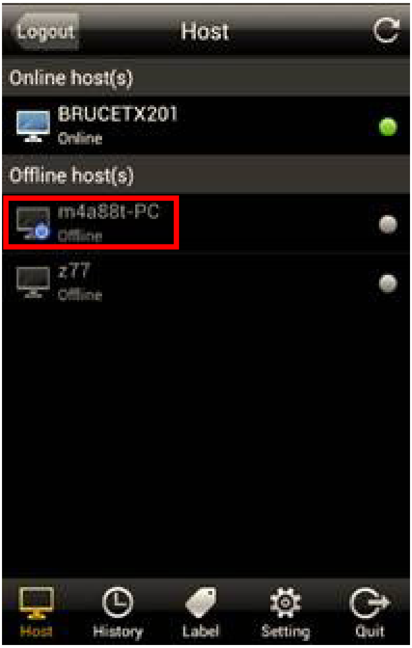
For iPad/iPhone users:

Tap one Host (Offline with Gray power button) on the Host List. Then tap the Power button to wakeup your home computer.


iPad
下午5:15
45%
Host list
Search
Online hosts
BRUCETX201
Offline hosts
m4a88t-PC
Z87

For Andriod mobile device users:

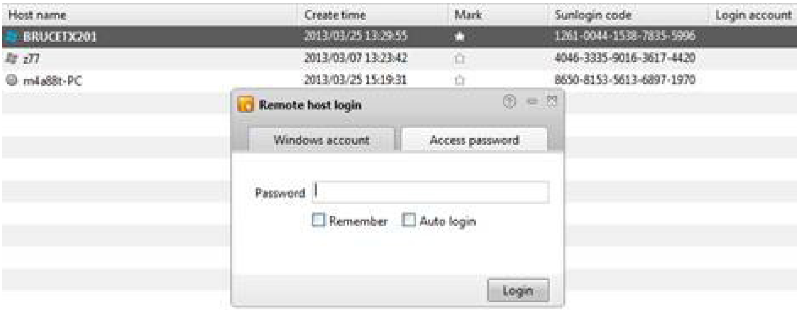
Tap one Host (Offline with Blue power button) on the Host List. Then tap the Power button to wakeup your home computer.


Logout
Host
Online host(s)
BRUCETX201
Online
Offline host(s)
m4a88t-PC
Offline
z77
Offline
Host
History
Label
Setting
Quit

Using Remote Control

For Windows users:

Right-click on a Host (Online with Blue Windows logo) on the control client panel. Then key in your remote access password.

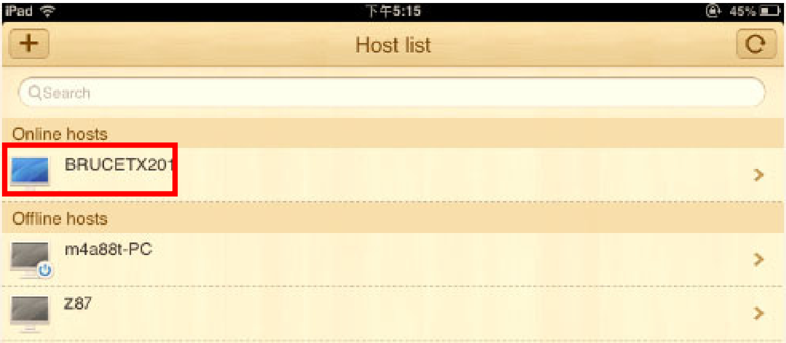


Host name	Create time	Mark	Sunlogin code	Login account
BRUCETX201	2013/03/25 13:29:55	★	1261-0044-1538-7835-5996	
z77	2013/03/07 13:23:42	☆	4046-3335-9016-3617-4420	
m4a88t-PC	2013/03/25 15:19:31	☆	8650-8153-5613-6897-1970	

Remote host login
Windows account
Access password
Password
☐ Remember
☐ Auto login
Login

For iPad/iPhone users:

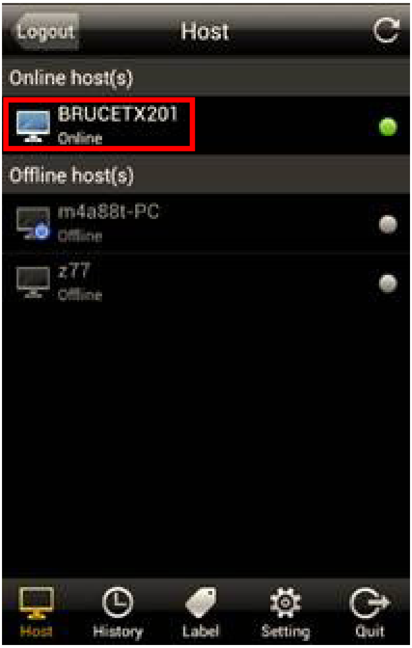
Tap one online machine on the Host List and fill in the Access password to start using remote control.



iPad
下午5:15
45%
+
Host list
Search
Online hosts
BRUCETX201
Offline hosts
m4a88t-PC
Z87

For Andriod mobile device users:

Tap one online machine and fill in the Access password to start using remote control.


Logout
Host
Online host(s)
BRUCETX201
Online
Offline host(s)
m4a88t-PC
Offline
z77
Offline
Host
History
Label
Setting
Quit

Tutorial Video

3.4 Start8

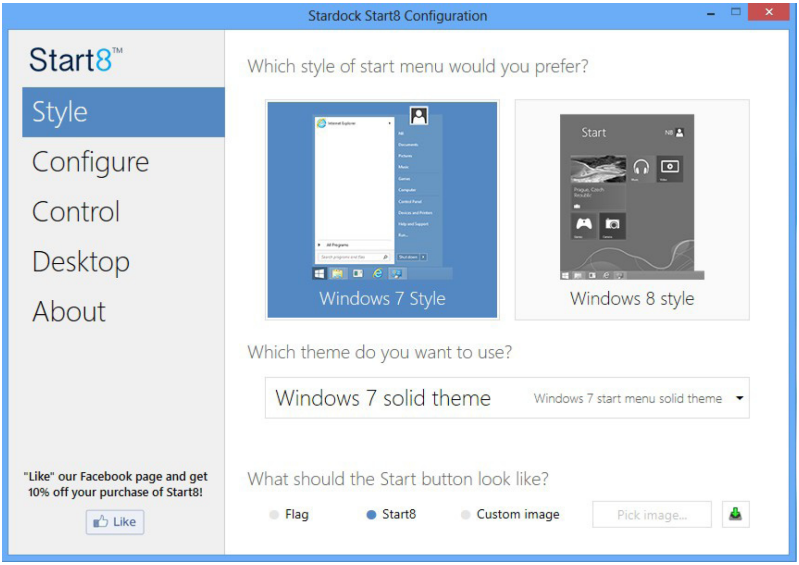
For those Windows 8 users who miss the Start Menu, Start8 is an ideal solution that brings back the familiar Start Menu along with added customizations for greater efficiency.

3.4.1 Installing Start8

Install Start8, which is located in the folder at the following path of the Support CD: \ ASRock Utility > Start8.

3.4.2 Configuring Start8

Style


Stardock Start8 Configuration
Start8™
Style
Configure
Control
Desktop
About
Like
Windows 7 Style
Windows 8 style
Pick image...

"Like" our Facebook page and get 10% off your purchase of Start8!

Which style of start menu would you prefer?

Which theme do you want to use?

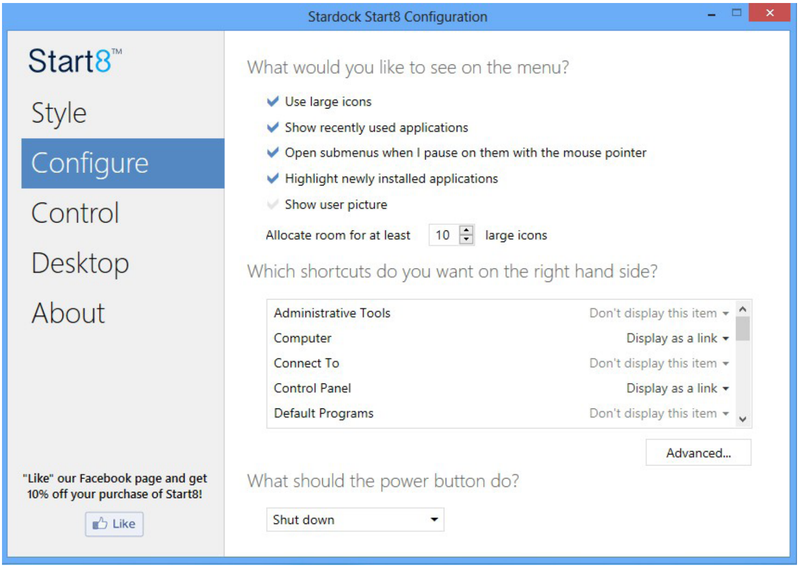
Windows 7 solid theme — Windows 7 start menu solid theme

What should the Start button look like?

○ Flag ● Start8 ○ Custom image

Select between the Windows 7 style and Windows 8 style Start Menu. Then select the theme of the Start Menu and customize the style of the Start icon.

Configure


Stardock Start8 Configuration
Start8™
Style
Configure
Control
Desktop
About
"Like" our Facebook page and get 10% off your purchase of Start8!
Like
Advanced...

What would you like to see on the menu?

☑ Use large icons
☑ Show recently used applications
☑ Open submenus when I pause on them with the mouse pointer
☑ Highlight newly installed applications
☐ Show user picture

Allocate room for at least 10 large icons

Which shortcuts do you want on the right hand side?

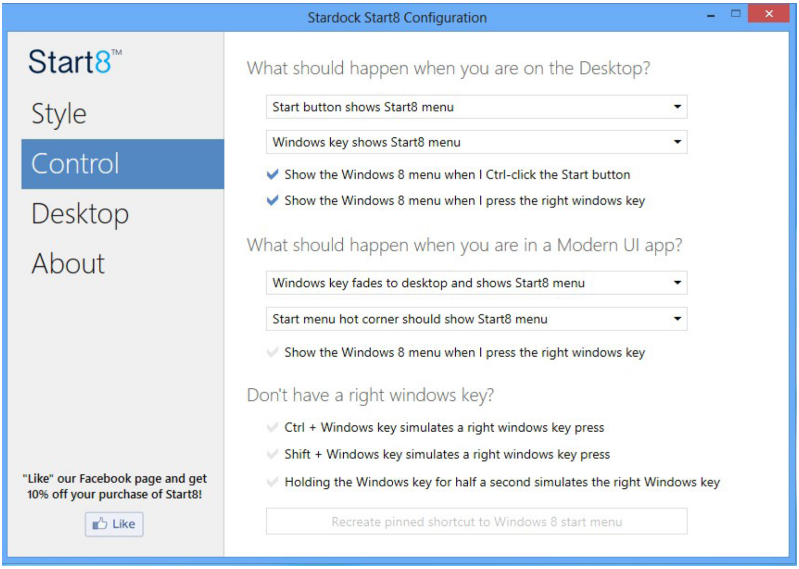
Administrative Tools	Don't display this item
Computer	Display as a link
Connect To	Don't display this item
Control Panel	Display as a link
Default Programs	Don't display this item

What should the power button do?

Shut down

Configure provides configuration options, including icon sizes, which shortcuts you want Start Menu to display, quick access to recently used apps, the functionality of the power button, and more.

Control


Stardock Start8 Configuration
Start8™
Style
Control
Desktop
About
"Like" our Facebook page and get 10% off your purchase of Start8!
Like
Recreate pinned shortcut to Windows 8 start menu

What should happen when you are on the Desktop?

Start button shows Start8 menu

Windows key shows Start8 menu

☑ Show the Windows 8 menu when I Ctrl-click the Start button
☑ Show the Windows 8 menu when I press the right windows key

What should happen when you are in a Modern UI app?

Windows key fades to desktop and shows Start8 menu

Start menu hot corner should show Start8 menu

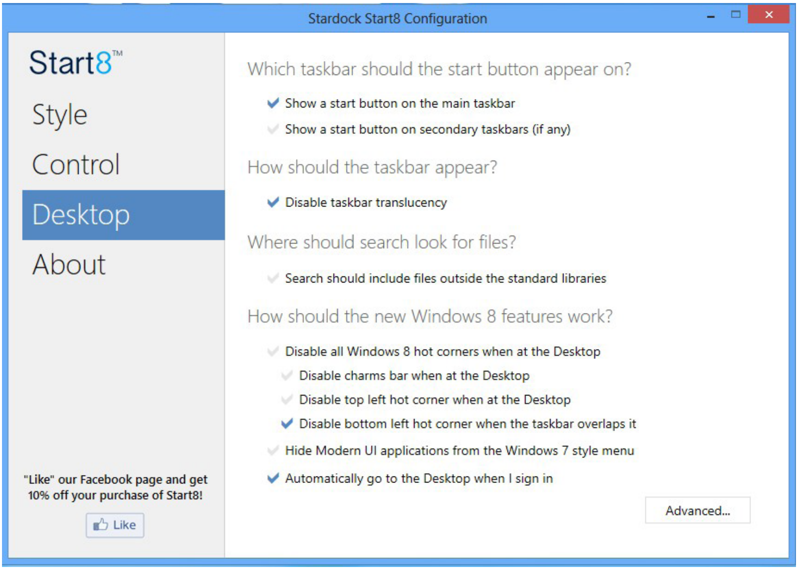
☐ Show the Windows 8 menu when I press the right windows key

Don't have a right windows key?

☐ Ctrl + Windows key simulates a right windows key press
☐ Shift + Windows key simulates a right windows key press
☐ Holding the Windows key for half a second simulates the right Windows key

Control lets you configure what a click on the start button or a press on the Windows key does.

Desktop


Stardock Start8 Configuration
Start8™
Style
Control
Desktop
About
"Like" our Facebook page and get 10% off your purchase of Start8!
Like
Advanced...

Which taskbar should the start button appear on?

☑ Show a start button on the main taskbar
☐ Show a start button on secondary taskbars (if any)

How should the taskbar appear?

☑ Disable taskbar translucency

Where should search look for files?

☐ Search should include files outside the standard libraries

How should the new Windows 8 features work?

☐ Disable all Windows 8 hot corners when at the Desktop
  ☐ Disable charms bar when at the Desktop
  ☐ Disable top left hot corner when at the Desktop
  ☑ Disable bottom left hot corner when the taskbar overlaps it
☐ Hide Modern UI applications from the Windows 7 style menu
☑ Automatically go to the Desktop when I sign in

Desktop allows you to disable the hot corners when you are working on the desktop. It also lets you choose whether or not the system boots directly into desktop mode and bypass the Metro user interface.

About

Displays information about Start8.

4. *UEFI SETUP UTILITY*

4.1 Introduction

ASRock Interactive UEFI is a blend of system configuration tools, cool sound effects and stunning visuals. Not only will it make BIOS setup less difficult but also a lot more amusing. This section explains how to use the UEFI SETUP UTILITY to configure your system. The UEFI chip on the motherboard stores the UEFI SETUP UTILITY. You may run the UEFI SETUP UTILITY when you start up the computer. Please press <F2> or <Delete> during the Power-On-Self-Test (POST) to enter the UEFI SETUP UTILITY, otherwise, POST will continue with its test routines.
If you wish to enter the UEFI SETUP UTILITY after POST, restart the system by pressing <Ctl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.

> Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen.

4.1.1 UEFI Menu Bar

The top of the screen has a menu bar with the following selections:

Main	For setting system time/date information
OC Tweaker	For overclocking configurations
Advanced	For advanced system configurations
Tool	Useful tools
H/W Monitor	Displays current hardware status
Boot	For configuring boot settings and boot priority
Security	For security settings
Exit	Exit the current screen or the UEFI SETUP UTILITY

Use < ← > key or < → > key to choose among the selections on the menu bar, and use < ↑ > key or < ↓ > key to move the cursor up or down to select items, then press <Enter> to get into the sub screen. You can also navigate with a mouse.

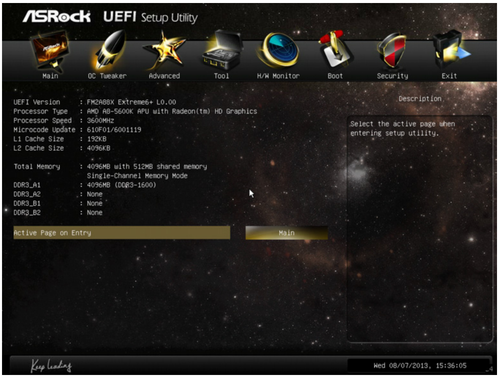
4.1.2 Navigation Keys

Please check the following table for the function description of each navigation key.

Navigation Key(s)	Function Description
← / →	Moves cursor left or right to select Screens
↑ / ↓	Moves cursor up or down to select items
+ / -	To change option for the selected items
<Tab>	Switch to next function
<Enter>	To bring up the selected screen
<PGUP>	Go to the previous page
<PGDN>	Go to the next page
<HOME>	Go to the top of the screen
<END>	Go to the bottom of the screen
<F1>	To display the General Help Screen
<F7>	Discard changes and exit the UEFI SETUP UTILITY
<F9>	Load optimal default values for all the settings
<F10>	Save changes and exit the UEFI SETUP UTILITY
<F12>	Print screen
<ESC>	Jump to the Exit Screen or exit the current screen

4.2 Main Screen

When you enter the UEFI SETUP UTILITY, the Main screen will appear and display the system overview.



```
UEFI Version      : FM2A88X Extreme6+ L0.00
Processor Type    : AMD A8-5600K APU with Radeon(tm) HD Graphics
Processor Speed   : 3600MHz
Microcode Update  : 610F01/6001119
L1 Cache Size     : 192KB
L2 Cache Size     : 4096KB

Total Memory      : 4096MB with 512MB shared memory
                    Single-Channel Memory Mode
DDR3_A1           : 4096MB (DDR3-1600)
DDR3_A2           : None
DDR3_B1           : None
DDR3_B2           : None

Active Page on Entry                    Main
```

Select the active page when entering setup utility.

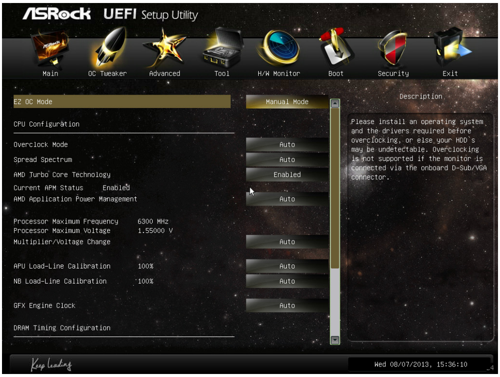
Wed 08/07/2013, 15:36:05

Active Page on Entry

This allows you to select the default page when entering UEFI setup utility.

4.3 OC Tweaker Screen

In the OC Tweaker screen, you can set up overclocking features.



```
EZ OC Mode                                     Manual Mode
CPU Configuration
Overclock Mode                                 Auto
Spread Spectrum                                Auto
AMD Turbo Core Technology                      Enabled
Current APM Status      Enabled
AMD Application Power Management               Auto

Processor Maximum Frequency     6300 MHz
Processor Maximum Voltage       1.55000 V
Multiplier/Voltage Change                      Auto

APU Load-Line Calibration       100%           Auto
NB Load-Line Calibration        100%           Auto

GFX Engine Clock                               Auto

DRAM Timing Configuration
```

Please install an operating system and the drivers required before overclocking, or else your HDD`s may be undetectable. Overclocking is not supported if the monitor is connected via the onboard D-Sub/VGA connector.

Wed 08/07/2013, 15:36:10

EZ OC Mode

You can use this option to adjust EZ overclocking setting. Please note that overclocing may cause damage to your components and motherboard. It should be done at your own risk and expense.

CPU Configuration

Overclock Mode

Use this to select Overclock Mode. Configuration options: [Auto] and [Manual]. The default value is [Auto].

APU/PCIE Frequency (MHz)

This item appears only when you set the item “Overclock Mode“ to [Manual]. The default value is [Disabled]. Please be noted that overclocking may reduce the D-Sub resolution and cause the display abnormal situation. It is recommended to use DVI or HDMI monitor to get better performance.

Spread Spectrum

This item should always be [Auto] for better system stability.

AMD Turbo Core Technology

This item appears only when the processor you adopt supports this feature. Use this to select enable or disable AMD Turbo Core Technology. Configuration options: [Enabled] and [Disabled]. The default value is [Enabled].

AMD Application power Management

Application Power Management (APM) ensures that average power consumption over a thermally significant time period remains at or below the TDP for the CPU mode being used. If [Enabled] is selected, the power consumption is reduced when overclocking.

Processor Maximum Frequency

It will display Processor Maximum Frequency for reference.

Processor Maximum Voltage

It will display Processor Maximum Voltage for reference.

Multiplier/Voltage Change

This item is set to [Auto] by default. If it is set to [Manual], you may adjust the value of Processor Frequency and Processor Voltage. However, it is recommended to keep the default value for system stability.

Boost Frequency Multiplier

For safety and system stability, it is not recommended to adjust the value of this item.

CPU Frequency Multiplier

For safety and system stability, it is not recommended to adjust the value of this item.

Voltage Control Mode

Use this to control voltage mode.

CPU Voltage

It allows you to adjust the value of CPU voltage. However, for safety and system stability, it is not recommended to adjust the value of this item.

CPU Voltage Offset

It allows you to adjust the value of CPU voltage offset. However, for safety and system stability, it is not recommended to adjust the value of this item.

CPU NB Frequency Multiplier

For safety and system stability, it is not recommended to adjust the value of this item.

APU Load-line Calibration

APU Load-line Calibration helps prevent APU voltage droop when the system is under heavy load.

NB Load-line Calibration

NB Load-line Calibration helps prevent NB voltage droop when the system is under heavy load.

GFX Engine Clock

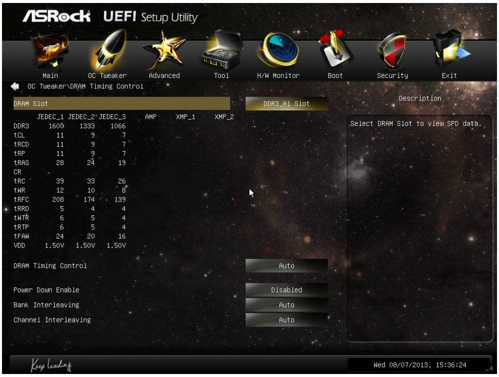
Use this to adjust GFX Engine Clock. The default value is [Auto].

DRAM Timing Configuration

DRAM Frequency

If [Auto] is selected, the motherboard will detect the memory module(s) inserted and assigns appropriate frequency automatically.

DRAM Timing Control



OC Tweaker\DRAM Timing Control

DRAM Slot: DDR3_A1 Slot

	JEDEC_1	JEDEC_2	JEDEC_3	AMP	XMP_1	XMP_2
DDR3	1600	1333	1066			
tCL	11	9	7			
tRCD	11	9	7			
tRP	11	9	7			
tRAS	28	24	19			
CR						
tRC	39	33	26			
tWR	12	10	8			
tRFC	208	174	139			
tRRD	5	4	4			
tWTR	6	5	4			
tRTP	6	5	4			
tFAW	24	20	16			
VDD	1.50V	1.50V	1.50V			

DRAM Timing Control: Auto

Power Down Enable: Disabled

Bank Interleaving: Auto

Channel Interleaving: Auto

Description

Select DRAM Slot to view SPD data.

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DRAM Slot

Use this item to view SPD data.

DRAM Timing Control

Use this item to control DRAM timing.

Power Down Enable

Use this item to enable or disable DDR power down mode.

Bank Interleaving

Interleaving allows memory accesses to be spread out over banks on the same node, or accross nodes, decreasing access contention.

Channel Interleaving

It allows you to enable Channel Memory Interleaving. Configuration options: [Disabled], [Auto]. The default value is [Auto].

Voltage Configuration

DRAM Voltage

Use this to select DRAM Voltage. The default value is [Auto].

APU PCIE Voltage VDDP

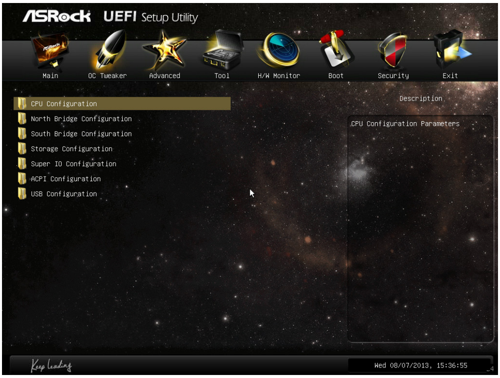
Use this to select APU PCIE Voltage VDDP. The default value is [Auto].

SB Voltage

Use this to select SB Voltage. The default value is [Auto].

4.4 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, Nouth Bridge Configuration, South Bridge Configuration, Storage Configuration, Super IO Configuration, ACPI Configuration and USB Configuration.

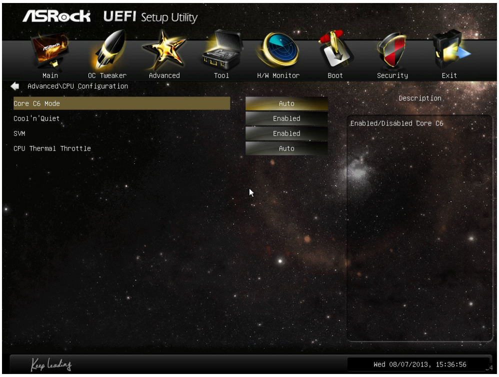

ASRock UEFI Setup Utility
Main
OC Tweaker
Advanced
Tool
H/W Monitor
Boot
Security
Exit
CPU Configuration
North Bridge Configuration
South Bridge Configuration
Storage Configuration
Super IO Configuration
ACPI Configuration
USB Configuration
Description
Keep leading

CPU Configuration Parameters

Wed 08/07/2013, 15:36:55

Setting wrong values in this section may cause the system to malfunction.

4.4.1 CPU Configuration



Advanced\CPU Configuration

Core C6 Mode: Auto
Cool'n'Quiet: Enabled
SVM: Enabled
CPU Thermal Throttle: Auto

Enabled/Disabled Core C6

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Core C6 Mode

Use this item to enable or disable Core C6 mode. The default value is [Enabled].

Package C6 Mode

This item appears only when you enable the item “Core C6 Mode”. Use this item to enable or disable Package C6 mode. The default value is [Disabled].

Cool ‘n’ Quiet

Use this item to enable or disable AMD’s Cool ‘n’ Quiet^{TM} technology. The default value is [Enabled]. Configuration options: [Enabled] and [Disabled]. If you install Windows® 8 / 7 and want to enable this function, please set this item to [Enabled]. Please note that enabling this function may reduce CPU voltage and memory frequency, and lead to system stability or compatibility issue with some memory modules or power supplies. Please set this item to [Disable] if above issue occurs.

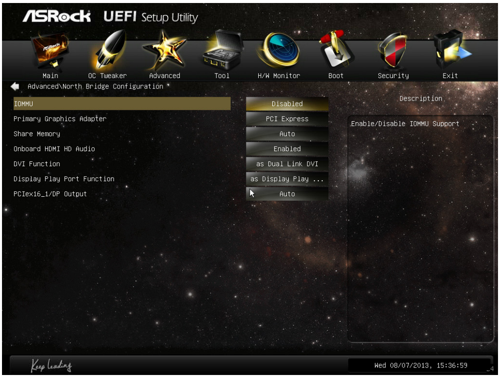
SVM

When this option is set to [Enabled], a VMM (Virtual Machine Architecture) can utilize the additional hardware capabilities provided by AMD-V. The default value is [Enabled]. Configuration options: [Enabled] and [Disabled].

CPU Thermal Throttle

Use this item to enable CPU internal thermal control mechanism to keep the CPU from overheated. The default value is [Auto].

4.4.2 North Bridge Configuration



Advanced\North Bridge Configuration

IOMMU	Disabled
Primary Graphics Adapter	PCI Express
Share Memory	Auto
Onboard HDMI HD Audio	Enabled
DVI Function	as Dual Link DVI
Display Play Port Function	as Display Play ...
PCIex16_1/DP Output	Auto

Description

Enable/Disable IOMMU Support

Wed 08/07/2013, 15:36:59

IOMMU

This allows you to enable or disable IOMMU support.

Primary Graphics Adapter

This item will switch the PCI Bus scanning order while searching for video card. It allows you to select the type of Primary VGA in case of multiple video controllers. The default value of this feature is [PCI Express]. Configuration options: [Onboard], [PCI] and [PCI Express].

Share Memory

This allows you to set the share memory feature. The default value is [Auto]. Configuration options: [Auto], [32MB], [64MB], [128MB], [256MB] [512MB], [1GB] and [2GB].

Onboard HDMI HD Audio

This allows you to enable or disable the “Onboard HDMI HD Audio” feature.

Dual Graphics

This item appears only when you install AMD RADEON graphics card on this motherboard. Use this to enable or disable Dual Graphics feature. If you enable this option, the primary monitor will be onboard VGA. If you select [Auto], Dual Graphics function will be automatically enabled when you install AMD RADEON graphics card. The default value is [Auto].

DVI Function

Use this to select DVI function when you install the DVI to HDMI adapter to DVI port. Configuration options: [as Dual Link DVI] and [as HDMI]. If you select [as Dual Link DVI], you can use Dual Link DVI monitor without audio function. If you select [as HDMI], you can use HDMI monitor with audio function. The default value is [as Dual Link DVI].

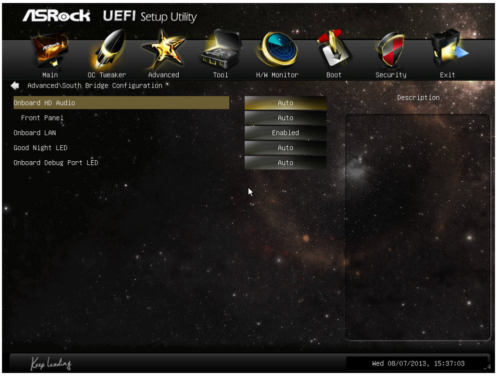
Display Play Port Function

Use this to select Display Play Port function. Configuration options: [as Display Play Port] and [as HDMI]. The default value is [as Display Play Port].

PCIex16_1/DP Output

Use this to select the PCIex16_1 slot/DP port output type. Configuration options: [Auto], [PCIex16_1] and [DP]. The default value is [Auto].

4.4.3 South Bridge Configuration


ASRock UEFI Setup Utility
Main
OC Tweaker
Advanced
Tool
H/W Monitor
Boot
Security
Exit
Advanced\South Bridge Configuration
Description
Keep leading
Wed 08/07/2013, 15:37:03

Onboard HD Audio Auto
Front Panel Auto
Onboard LAN Enabled
Good Night LED Auto
Onboard Debug Port LED Auto

Onboard HD Audio

Select [Auto], [Enabled] or [Disabled] for the onboard HD Audio feature. If you select [Auto], the onboard HD Audio will be disabled when PCI Sound Card is plugged.

Front Panel

Select [Auto] or [Disabled] for the onboard HD Audio Front Panel.

Onboard LAN

This allows you to enable or disable the onboard LAN feature.

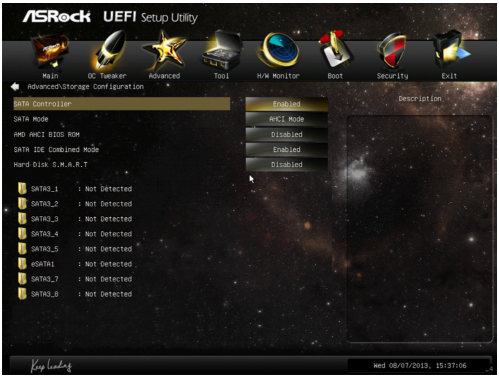
Good Night LED

Enable this option to turn off Power LED and Port80 LED when the system is power on. The keyboard LED will also be turned off in S1, S3 and S4 state. The default value is [Auto].

Onboard Debug Port LED

Use this to enable or disable onboard debug port LED. The default value is [Auto].

4.4.4 Storage Configuration



```
Advanced\Storage Configuration

SATA Controller            Enabled
SATA Mode                  AHCI Mode
AMD AHCI BIOS ROM          Disabled
SATA IDE Combined Mode     Enabled
Hard Disk S.M.A.R.T        Disabled

SATA3_1   : Not Detected
SATA3_2   : Not Detected
SATA3_3   : Not Detected
SATA3_4   : Not Detected
SATA3_5   : Not Detected
eSATA1    : Not Detected
SATA3_7   : Not Detected
SATA3_8   : Not Detected

Wed 08/07/2013, 15:37:06
```

SATA Controller

Use this item to enable or disable the “SATA Controller” feature.

SATA Mode

Use this item to adjust SATA Mode. The default value of this option is [AHCI Mode]. Configuration options: [AHCI Mode], [RAID Mode] and [IDE Mode].

> If you set this item to RAID mode, it is suggested to install SATA ODD driver on SATA3_5, SATA3_7, SATA3_8 and eSATA ports.

AMD AHCI BIOS ROM

Use this item to enable or disable AMD AHCI BIOS ROM. The default value of this option is [Disabled].

SATA IDE Combined Mode

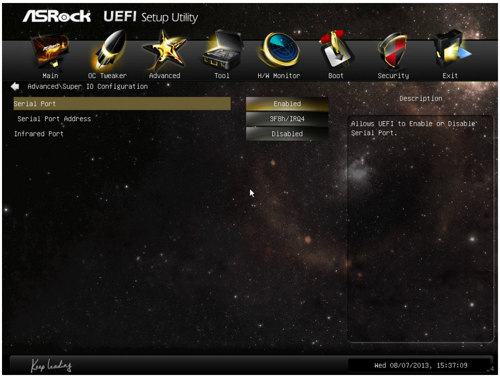
This item is for SATA3_5, SATA3_7, SATA3_8 and eSATA ports. Use this item to enable or disable SATA IDE combined mode. The default value is [Enabled].

> If you want to build RAID on SATA3_5, SATA3_7, SATA3_8 and eSATA ports, please disable this item.

Hard Disk S.M.A.R.T.

Use this item to enable or disable the S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) feature. Configuration options: [Disabled], [Auto], [Enabled].

4.4.5 Super IO Configuration


ASRock UEFI Setup Utility
Main
OC Tweaker
Advanced
Tool
H/W Monitor
Boot
Security
Exit
Keep leading

Advanced\Super IO Configuration

Serial Port	Enabled
Serial Port Address	3F8h/IRQ4
Infrared Port	Disabled

Description

Allows UEFI to Enable or Disable Serial Port.

Wed 08/07/2013, 15:37:09

Serial Port

Use this item to enable or disable the onboard serial port.

Serial Port Address

Use this item to set the address for the onboard serial port.

Configuration options: [3F8h / IRQ4] and [3E8h / IRQ4].

Infrared Port

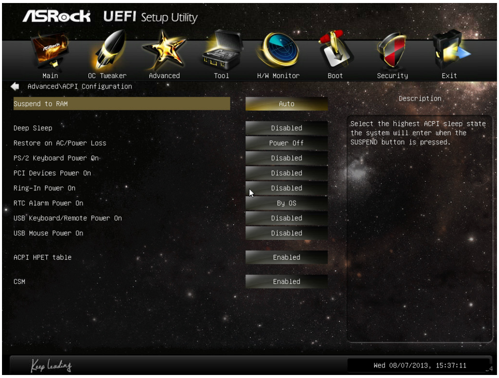
Use this item to enable or disable the onboard infrared port.

Infrared Port Address

Use this item to set the address for the onboard infrared port.

Configuration options: [2F8h / IRQ3] and [2E8h / IRQ3].

4.4.6 ACPI Configuration



Suspend to RAM	Auto
Deep Sleep	Disabled
Restore on AC/Power Loss	Power Off
PS/2 Keyboard Power On	Disabled
PCI Devices Power On	Disabled
Ring-In Power On	Disabled
RTC Alarm Power On	By OS
USB Keyboard/Remote Power On	Disabled
USB Mouse Power On	Disabled
ACPI HPET table	Enabled
CSM	Enabled

Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

Wed 08/07/2013, 15:37:11

Suspend to RAM

Use this item to select whether to auto-detect or disable the Suspend-to-RAM feature. Select [Auto] will enable this feature if the OS supports it.

Deep Sleep

Configure deep sleep mode for power saving when the computer is shut down. We recommend disabling Deep Sleep for better system compatibility and stability.

Restore on AC/Power Loss

This allows you to set the power state after an unexpected AC/power loss. If [Power Off] is selected, the AC/power remains off when the power recovers. If [Power On] is selected, the AC/power resumes and the system starts to boot up when the power recovers.

PS/2 Keyboard Power On

Use this item to enable or disable PS/2 keyboard to turn on the system from the power-soft-off mode.

PCI Devices Power On

Use this item to enable or disable PCI devices to turn on the system from the power-soft-off mode.

Ring-In Power On

Use this item to enable or disable Ring-In signals to turn on the system from the power-soft-off mode.

RTC Alarm Power On

Use this item to enable or disable RTC (Real Time Clock) to power on the system.

USB Keyboard/Remote Power On

Use this item to enable or disable USB Keyboard/Remote to power on the system.

USB Mouse Power On

Use this item to enable or disable USB Mouse to power on the system.

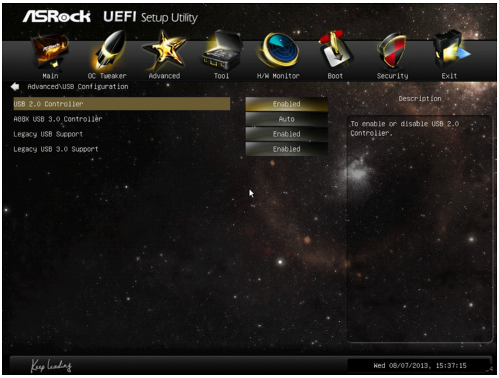
ACPI HPET table

Use this item to enable or disable ACPI HPET Table. The default value is [Enabled]. Please set this option to [Enabled] if you plan to use this motherboard to submit Windows® certification.

CSM

Please disable CSM when you enable Fast Boot option. The default value is [Enabled].

4.4.7 USB Configuration



Advanced\USB Configuration

USB 2.0 Controller Enabled
A88X USB 3.0 Controller Auto
Legacy USB Support Enabled
Legacy USB 3.0 Support Enabled

Description

To enable or disable USB 2.0 Controller.

Wed 08/07/2013, 15:37:15

USB 2.0 Controller

Use this item to enable or disable the use of USB 2.0 controller.

A88X USB 3.0 Controller

Use this item to enable or disable the use of USB 3.0 controller.

Legacy USB Support

Use this option to select legacy support for USB devices. There are four configuration options: [Enabled], [Auto], [Disabled] and [UEFI Setup Only]. The default value is [Enabled]. Please refer to below descriptions for the details of these four options:

[Enabled] - Enables support for legacy USB.

[Auto] - Enables legacy support if USB devices are connected.

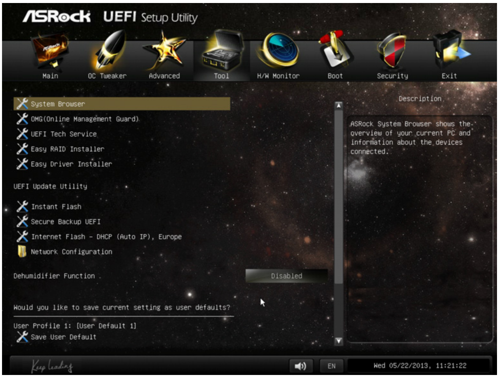
[Disabled] - USB devices are not allowed to use under legacy OS and UEFI setup when [Disabled] is selected. If you have USB compatibility issue, it is recommended to select [Disabled] to enter OS.

[UEFI Setup Only] - USB devices are allowed to use only under UEFI setup and Windows / Linux OS.

Legacy USB 3.0 Support

Use this option to enable or disable legacy support for USB 3.0 devices. The default value is [Enabled].

4.5 Tool


ASRock UEFI Setup Utility
Main
OC Tweaker
Advanced
Tool
H/W Monitor
Boot
Security
Exit
System Browser
OMG(Online Management Guard)
UEFI Tech Service
Easy RAID Installer
Easy Driver Installer
UEFI Update Utility
Instant Flash
Secure Backup UEFI
Internet Flash - DHCP (Auto IP), Europe
Network Configuration
Save User Default
Description
EN
Keep leading

Dehumidifier Function: Disabled

Would you like to save current setting as user defaults?

User Profile 1: [User Default 1]

ASRock System Browser shows the overview of your current PC and information about the devices connected.

Wed 05/22/2013, 11:21:22

System Browser

System Browser can let you easily check your current system configuration in UEFI setup.

OMG(Online Management Guard)

Administrators are able to establish an internet curfew or restrict internet access at specified times via OMG. You may schedule the starting and ending hours of internet access granted to other users. In order to prevent users from bypassing OMG, guest accounts without permission to modify the system time are required.

UEFI Tech Service

Contact ASRock Tech Service if you are having trouble with your PC. Please setup network configuration before using UEFI Tech Service.

Easy RAID Installer

Easy RAID Installer helps you to copy the RAID driver from the support CD to your USB storage device. After copying the drivers please change the SATA mode to RAID, then you can start installing the operating system in RAID mode.

Easy Driver Installer

For users that don't have an optical disk drive to install the drivers from our support CD, Easy Driver Installer is a handy tool in the UEFI that installs the LAN driver to your system via an USB storage device, then downloads and installs the other required drivers automatically.

UEFI Update Utility

Instant Flash

Instant Flash is a UEFI flash utility embedded in Flash ROM. This convenient UEFI update tool allows you to update system UEFI without entering operating systems first like MS-DOS or Windows®. Just save the new

UEFI file to your USB flash drive, floppy disk or hard drive and launch this tool, then you can update your UEFI only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system. If you execute Instant Flash utility, the utility will show the UEFI files and their respective information. Select the proper UEFI file to update your UEFI, and reboot your system after the UEFI update process is completed.

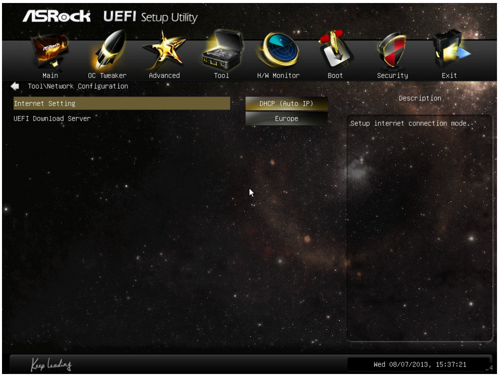
Secure Backup UEFI

For users that don't have an optical disk drive to install the drivers from our support CD, Easy Driver Installer is a handy tool in the UEFI that installs the LAN driver to your system via an USB storage device, then downloads and installs the other required drivers automatically.

Internet Flash

Internet Flash searches for available UEFI firmware updates from our servers. In other words, the system can auto-detect the latest UEFI from our servers and flash them without entering Windows OS.

Network Configuration



Tool\Network Configuration

Internet Setting DHCP (Auto IP)

UEFI Download Server Europe

Description

Setup internet connection mode.

Wed 08/07/2013, 15:37:21

Internet Setting

Use this item to set up the internet connection mode. Configuration options: [DHCP (Auto IP)] and [PPPOE].

UEFI Download Server

Use this item to select UEFI firmware download server for Internet Flash. Configuration options: [Asia], [Europe], [USA] and [China].

Dehumidifier Function

Users may prevent motherboard damages due to dampness by enabling "Dehumidifier Function". When enabling Dehumidifier Function, the computer will power on automatically to dehumidify the system after entering S4/S5 state.

Dehumidifier Period

This allows users to configure the period of time until the computer powers on and enables “Dehumidifier” after entering S4/S5 state.

Dehumidifier Duration

This allows users to configure the duration of the dehumidifying process before it returns to S4/S5 state.

Dehumidifier CPU Fan Setting

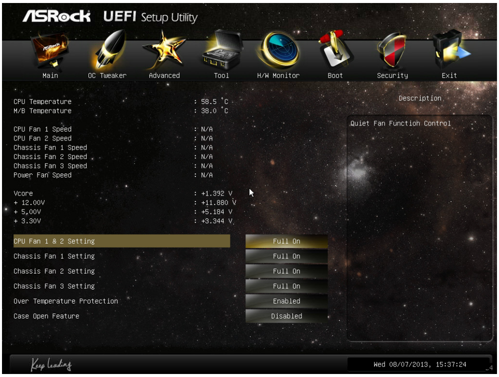
Use this setting to configure CPU fan speed while “Dehumidifier” is enabled.

Would you like to save current setting user defaults?

In this option, you are allowed to load and save three user defaults according to your own requirements.

4.6 Hardware Health Event Monitoring Screen

In this section, it allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, CPU fan speed, chassis fan speed, and the critical voltage.



```
CPU Temperature                  : 58.5 °C
M/B Temperature                  : 38.0 °C

CPU Fan 1 Speed                  : N/A
CPU Fan 2 Speed                  : N/A
Chassis Fan 1 Speed              : N/A
Chassis Fan 2 Speed              : N/A
Chassis Fan 3 Speed              : N/A
Power Fan Speed                  : N/A

Vcore                            : +1.392 V
+ 12.00V                         : +11.880 V
+ 5.00V                          : +5.184 V
+ 3.30V                          : +3.344 V

CPU Fan 1 & 2 Setting                     Full On
Chassis Fan 1 Setting                     Full On
Chassis Fan 2 Setting                     Full On
Chassis Fan 3 Setting                     Full On
Over Temperature Protection               Enabled
Case Open Feature                         Disabled
```

Quiet Fan Function Control

Wed 08/07/2013, 15:37:24

CPU Fan 1 & 2 Setting

This allows you to set the CPU fan 1 & 2 speed. Configuration options: [Full On] and [Automatic Mode]. The default is value [Full On].

Chassis Fan 1 Setting

This allows you to set the chassis fan 1 speed. Configuration options: [Full On], [Manual Mode] and [Automatic Mode]. The default is value [Full On].

Chassis Fan 2 Setting

This allows you to set the chassis fan 2 speed. Configuration options: [Full On] and [Manual Mode]. The default is value [Full On].

Chassis Fan 3 Setting

This allows you to set the chassis fan 3 speed. Configuration options: [Full On] and [Manual Mode]. The default is value [Full On].

Over Temperature Protection

Use this item to enable or disable Over Temperature Protection. The default value is [Enabled].

Case Open Feature

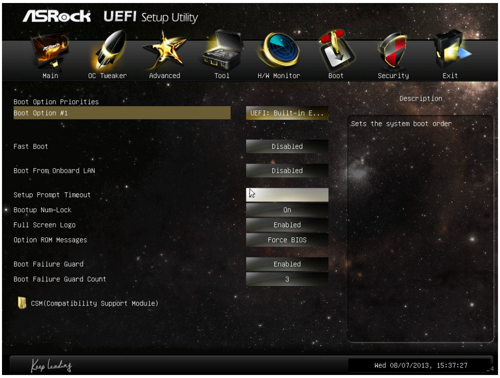
This allows you to enable or disable case open detection feature. The default is value [Disabled].

Clear Status

This option appears only when the case open has been detected. Use this option to keep or clear the record of previous chassis intrusion status.

4.7 Boot Screen

In this section, it will display the available devices on your system for you to configure the boot settings and the boot priority.



Boot Option Priorities
Boot Option #1 UEFI: Built-in E...
Fast Boot Disabled
Boot From Onboard LAN Disabled
Setup Prompt Timeout
Bootup Num-Lock On
Full Screen Logo Enabled
Option ROM Messages Force BIOS
Boot Failure Guard Enabled
Boot Failure Guard Count 3
CSM(Compatibility Support Module)

Sets the system boot order

Wed 08/07/2013, 15:37:27

Fast Boot

Fast Boot minimizes your computer's boot time. There are three configuration options: [Disabled], [Fast] and [Ultra Fast]. The default value is [Disabled]. Please refer to below descriptions for the details of these three options:

[Disabled] - Disable Fast Boot.

[Fast] - The only restriction is you may not boot by using an USB flash drive.

[Ultra Fast] - There are a few restrictions.

1. Only supports Windows® 8 UEFI operating system.
2. You will not be able to enter BIOS Setup (Clear CMOS or run utility in Widows® to enter BIOS Setup).
3. If you are using an external graphics card, the VBIOS must support UEFI GOP in order to boot.

Boot From Onboard LAN

Use this item to enable or disable the Boot From Onboard LAN feature.

Setup Prompt Timeout

This shows the number of seconds to wait for setup activation key.

Bootup Num-Lock

If this item is set to [On], it will automatically activate the Numeric Lock function after boot-up.

Full Screen Logo

Use this item to enable or disable OEM Logo. The default value is [Enabled].

Option ROM Messages

[Force BIOS] - The third-party ROM messages will be forced to display during the bootsequence.

[Keep Current] - The third-party ROM messages will be displayed only if the third-partymanufacturer had set the add-on device to do so.

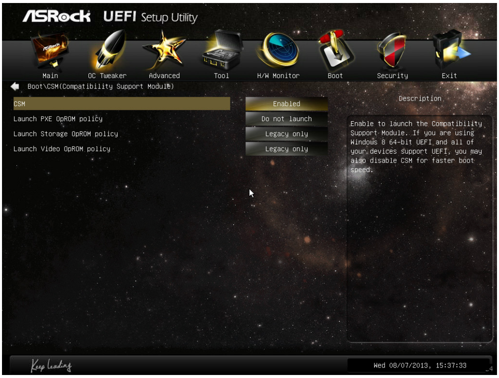
Boot Failure Guard

Enable or disable the feature of Boot Failure Guard.

Boot Failure Guard Count

Enable or disable the feature of Boot Failure Guard Count.

CSM (Compatibility Support Module)



Boot\CSM(Compatibility Support Module)

CSM Enabled
Launch PXE OpROM policy Do not launch
Launch Storage OpROM policy Legacy only
Launch Video OpROM policy Legacy only

Enable to launch the Compatibility Support Module. If you are using Windows 8 64-bit UEFI and all of your devices support UEFI, you may also disable CSM for faster boot speed.

Wed 08/07/2013, 15:37:33

CSM

Enable to launch the Compatibility Support Module. Please do not disable unless you're running a WHCK test. If you are using Windows$^{®}$ 8 64-bit and all of your devices support UEFI, you may also disable CSM for faster boot speed.

Launch PXE OpROM Policy

Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Do not launch?

Launch Storage OpROM Policy

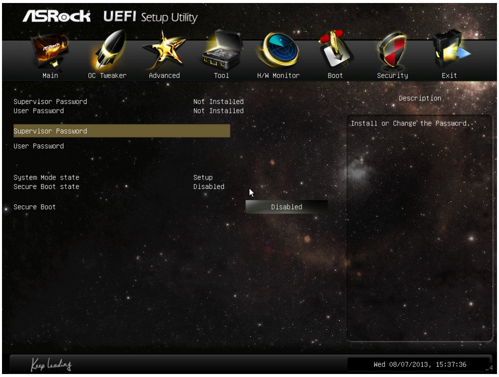
Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Do not launch?

Launch Video OpROM Policy

Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Do not launch?

4.8 Security Screen

In this section, you may set or change the supervisor/user password for the system. For the user password, you may also clear it.


ASRock UEFI Setup Utility
Main
OC Tweaker
Advanced
Tool
H/W Monitor
Boot
Security
Exit
Keep leading

```
Supervisor Password                 Not Installed
User Password                       Not Installed

Supervisor Password

User Password


System Mode state                   Setup
Secure Boot state                   Disabled

Secure Boot                                          Disabled
```

Description

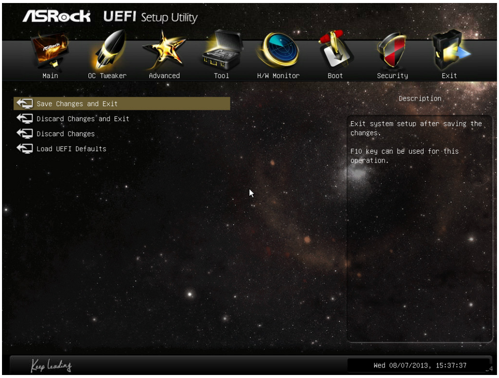
Install or Change the Password.

Wed 08/07/2013, 15:37:36

Secure Boot

Enable to support Windows® 8 Secure Boot.

4.9 Exit Screen


ASRock UEFI Setup Utility
Main
OC Tweaker
Advanced
Tool
H/W Monitor
Boot
Security
Exit
Save Changes and Exit
Discard Changes and Exit
Discard Changes
Load UEFI Defaults
Description
Keep leading

Exit system setup after saving the changes.

F10 key can be used for this operation.

Wed 08/07/2013, 15:37:37

Save Changes and Exit

When you select this option, it will pop-out the following message, “Save configuration changes and exit setup?” Select [OK] to save the changes and exit the UEFI SETUP UTILITY.

Discard Changes and Exit

When you select this option, it will pop-out the following message, “Discard changes and exit setup?” Select [OK] to exit the UEFI SETUP UTILITY without saving any changes.

Discard Changes

When you select this option, it will pop-out the following message, “Discard changes?” Select [OK] to discard all changes.

Load UEFI Defaults

Load UEFI default values for all the setup questions. F9 key can be used for this operation.

Contact Information

If you need to contact ASRock or want to know more about ASRock, you're welcome to visit ASRock's website at http://www.asrock.com; or you may contact your dealer for further information. For technical questions, please submit a support request form at http://www.asrock.com/support/tsd.asp

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